The AMIGA FORMAT Bumper Book of Amiga Hints and Tips

Edited by
Nick Veitch

The Amiga Format Bumper Book Of Amiga Hints and Tips
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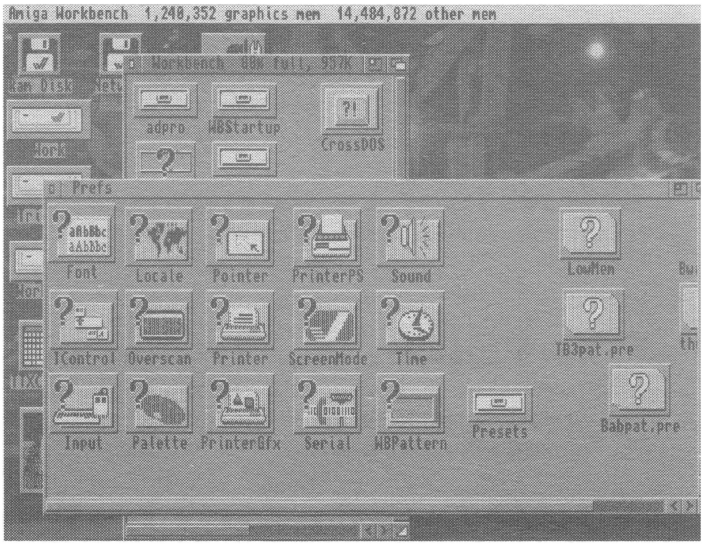
INTRODUCTION



Workbench has many hidden secrets – find out where and what they are on page 11.

Welcome to this bumper edition of hints and tips for the Amiga. This book is a completely updated guide to all things Amiga, and contains masses of useful information that should help out those who are maybe plugging in their new machine for the first time as well as a few pointers for seasoned veterans who reckon they know it all.

The book is divided up into sections to make it easy to navigate through, and it is a nice size that will fit into any anorak pocket with ease.

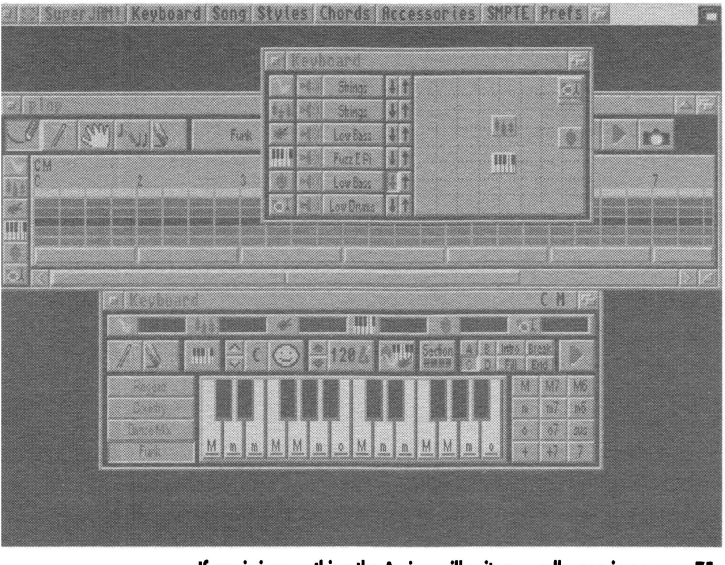
Those of you who are new to the Amiga may not have realised just what an exciting world you were getting into. If you thought your Amiga was a great games machine, then you are quite right – but much more than that it is probably the single most powerful mind tool that you have at your disposal. If used properly, your Amiga will enable you to explore the world of computer graphics, to compose and master music, to take control of your finances, to express

yourself artistically and to get in touch with like-minded people all over the world.

The Amiga is an unusually powerful home computer. Many people have written it off as a games machine that will be first up against the wall when the console boom really takes off. Well, that doesn't look like it's happening. Sales of the A1200 have remained steady, in spite of the multi-million dollar efforts of companies like Sega.

The detractors fail to realise that the features that make the Amiga a great games machine also make it a great tool. The amazingly fast graphics, demanded by the modern game, mean that the Amiga is also capable of being used as a graphics and video workstation. The raw processing power required for a scrolling shoot-em-up comes in handy for number crunching and raytracing, the sound channels are just what is required for composing your own music – all in all it is a stunning machine, but people very rarely use it to its full potential.

This is partly due to users not being bothered about making music or whatever, but some of them give up because they don't understand what is going on. These are the users this book is aimed at. It's not a beginners' guide, but it does



If music is your thing the Amiga will suit you well - pop in on page 75.

give useful background information and many pointers for the unwary. There are a few useful contacts and addresses at the back of the book, and a glossary to help explain some of the jargon which might be stopping you from getting the most out of your machine.

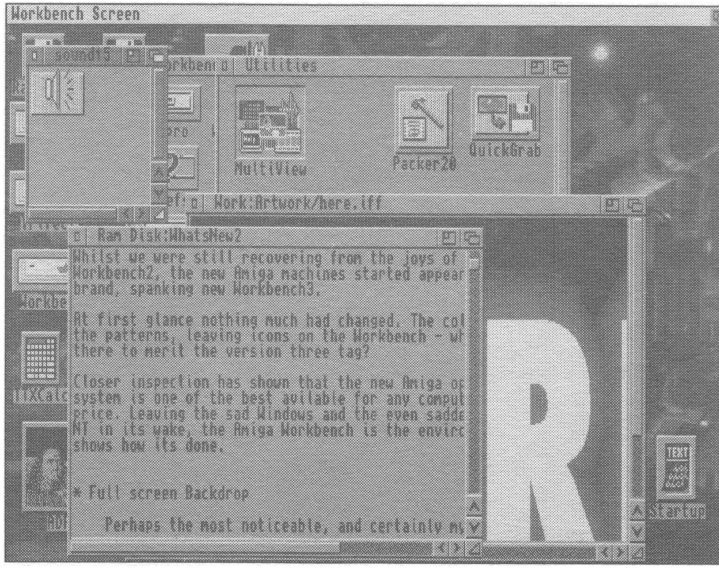
Well, I don't want to wibble on all day. I just want to say that I hope you find this book a useful reference, and that it helps you to understand your machine much better.

The Amiga excels at graphics, and so can you if you check out page 61.

Amiga
Workbench
Version 3.0
Workbench
Version 2.05
Commodore
AMIGA

WORKBENCH

WORKBENCH


Workbench Screen
Utilities
MultiView
Packer20
QuickGrab
Work:Artwork/here.iff
Ram Disk:WhatsNew2
Whilst we were still recovering from the joys of
Workbench2, the new Amiga machines started appear
brand, spanking new Workbench3.
At first glance nothing much had changed. The col
the patterns, leaving icons on the Workbench - wh
there to merit the version three tag?
Closer inspection has shown that the new Amiga op
system is one of the best avilable for any comput
price. Leaving the sad Windows and the even sadde
AT in its wake, the Amiga Workbench is the enviro
shows how its done.
* Full screen Backdrop
Perhaps the most noticeable, and certainly mo
TEXT
Startup

Using Multiview on you machine is a quick and easy way of displaying pictures and text files, or for playing sampled sounds.

The Workbench environment is the place you will spend most of your time (when not playing games) so it is probably a good idea to become familiar with it. It can be a little confusing, particularly if you have not owned a computer before. In the past, the manuals supplied with the Amiga have not been thorough enough to deal with all the problems and questions which new users often have. These days the manuals are a lot better and I urge you to read through them. If you have an A1200 you may not have the Commodore AmigaDOS manual. It is a good idea to get hold of a manual of some sort, either our own AmigaDOS and Workbench Reference book, or one of the many AmigaDOS books now on the market.

Starting out

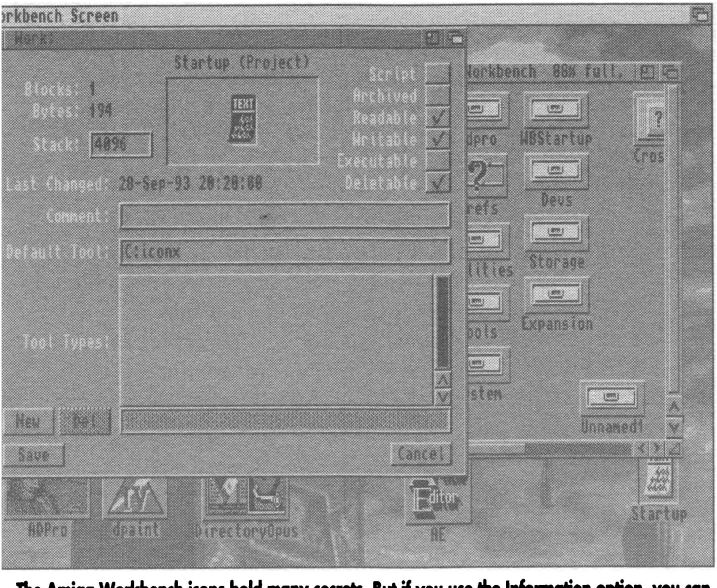
The Amiga's operating system is actually split into two parts. The routines for driving the custom chips, running the disk

drive and handling data are actually stored on a chip inside the machine called the Kickstart ROM.

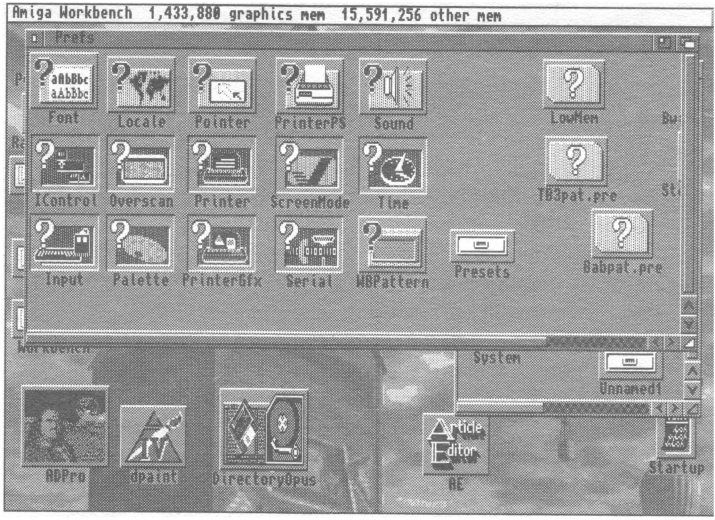
There is sufficient information stored here for many programs, usually games, to work without any additional help, but in order to use AmigaDOS and the icon driven environment that makes the Amiga the machine it is, you will have to load up the other half of the operating system. This is kept on a floppy disk, which is known as Workbench.

When you turn your machine on it will ask you to insert this disk into the drive. When the disk is inserted, the rest of the software will be loaded in automatically.

The Amiga uses what is known as a WIMP system. This doesn't mean that it has sand kicked in its face, though, in fact it stands for Windows Icons Menus and Pointers. It is very similar to the system used by Apple Macintosh computers, Acorn Archimedes and the replacement operating system for the IBM PC, Microsoft Windows. All disks, files and windows are represented graphically on the screen. They are accessed by using the mouse, a device which translates its physical movement on a desk (or whatever) into instructions



The Amiga Workbench icons hold many secrets. But if you use the Information option, you can probe into their depths.



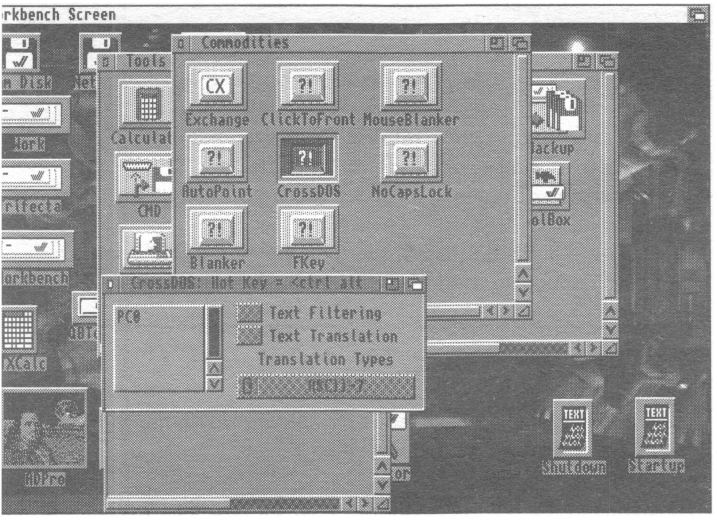
You can select a multiple of files by holding down the shift key.

which move a small pointer around the computer's screen. The mouse has two buttons on it which can be used to instruct the pointer to activate whatever it happens to be on top of.

In this way, the mouse is used to run programs, access disks and copy files. It may take a while to get used to, but it does become second nature, and it is certainly a lot easier than learning lots of complicated commands and spending all your time typing things in.

There is another side to the Amiga which does enable you type in commands directly. This is done through the Shell. In the section that follows there is a brief summary of the more important Shell/CLI commands and how to use them.

The easiest way to become familiar with Workbench is to play around with it (when you do, make sure you are only using a copy of your original disks). There is nothing you can do with the mouse, and nothing that you could type in that could damage your machine. The worst you could do is delete some of the data on your disks, but if you have made a copy beforehand there is nothing to worry about.



CrossDOS enables the Amiga to read and write disks that are compatible with the IBM PC.

Icons

The icon files on Workbench are not there purely for decoration. A great deal of important information can be gleaned from them. If you don't believe me, select an icon and press the 'Right-Amiga' and 'I' keys simultaneously. A window will appear giving information about the size of the associated files, its type, how many disk blocks it takes up, when it was last modified and which protection bits are set.

If the icon is a data file for an application (that means it will appear as a 'Project' type icon), then the Tool Type gadget will more than likely show the path of the application that created it.

The Tool Type is how the data file automatically launches a particular application when you double-click on the icon. You can change this path to be whatever you like, but if you change the 'Tool' or application, that the file may not work if that particular data format is not supported by the new application, so make sure that it is.

The protection bits can also be set from this window. The important ones are:

Archived – This bit acts as a flag, telling software that this

file has already been backed up. Very useful for doing generation backups.

Readable – If this box is not checked, applications are prevented from accessing any of the data in this file. Occasionally used to mark off disk sectors as 'out if order'.

Writeable – Can be written to, or amended.

Executeable – The file is a binary program, which can be run.

Deletable – If this flag is not set, then the AmigaDOS delete command cannot be used to erase the file from the disk.

HINTS AND TIPS

● You can multiple select icons by holding down the shift key while clicking on them with the pointer.

● Icons can be left out on the desktop by selecting the icon and choosing 'Leave Out' from the icon menu. This can be made permanent by Snapshoting the icon too. This is a great way of speeding up disk access. You can leave out application icons and they will appear on your Workbench as soon as the disk is inserted into the drive.

● If your mouse has fallen under the desk, you can emulate its functions with the keyboard. When holding down either Amiga key, the two Alt buttons emulate the mouse buttons, and the cursor keys control the pointer position. If you press shift as well, the pointer will jump in steps of 10 pixels.

● In an AmigaDOS text gadget it is possible to clear all the text at the touch of a button. Well, two buttons actually – 'Right Amiga' and 'X'.

● When multitasking, you can switch between screens by using the 'Left Amiga' and the 'N' and 'M' keys.

● When you get an AmigaDOS requestor, you don't have to use the mouse to respond. 'Left Amiga' and 'B' is cancel, 'Left Amiga' and 'V' is the equivalent of OK.

oaded
as command: C:ConClip
oaded as command: Workbench
No command loaded
Loaded as command: status
No command loaded
ocess
ocess
migaShell
n
ypes
le
t
0 blocks used
1496 --p-rwed 02-Sep-92 11:51:33
4804 --p-rwed 02-Sep-92 11:51:33
852 --p-rwed 02-Sep-92 11:51:33
1068 --p-rwed 02-Sep-92 11:51:33
5880 --p-rwed 02-Sep-92 11:51:33
1520 --p-rwed 02-Sep-92 11:51:33
5068 --p-rwed 02-Sep-92 11:51:33
75500 ----rwed 22-May-93 11:51:33
52132 ----rwed 03-Jun-93 12:32:58
114428 --p-rwed 16-Jun-93 13:32:58
12516 ----rwed
53525 ----
D Amig
New Shel
1> newshe
1>

CLI & SHELL

THE SHELL

Workbench is only part of the operating system. is hidden under the surface in the form of the CLI igaDOS. Although most everyday tasks can be per- ed quite easily without ever having to resort to the CLI Shell on later versions of Workbench). Here are explanations for the most important commands:

ADDBUFFERS

This uses up an amount of memory as a cache to speed up transfer of data between the Amiga and the selected device. An example of this would be:

```
Addbuffers DF0: 20
```

which assigns 20k of memory as a cache. This command should be in your startup-sequence (explained later).

ASSIGN

This command is used to set up a logical device and directs it towards a particular directory path. It is not only useful for providing a quick pathway to deeply hidden subdirectories, but it is also vital to the installation of a lot of software, because it can also be used to trick AmigaDOS. For example, if you had a wordpro which came on three floppies (WP1, WP2 and WP3 for the sake of argument) and you installed it on a hard drive partition called 'Work:', the following commands would fool the program into looking on the hard-drive instead of the floppy for its external files:

```
Assign wp1: Work:
Assign wp2: Work:
Assign wp3: Work:
```

It can also be used to redirect system directories such as Fonts: or devs:

```
Assign libs: Work:libs
```

AVAIL

This is not an irreplaceable command, but it does let you know exactly how much memory you have available and the largest block.

CD

This command is used to change the current directory. For example:

```
cd workbench:devs/printers
```

If you use this command without a pathname, it will tell you the current directory path.

COPY

This is used to transfer files between directories. A simple example would be:

```
copy c:addbuffers ram:
```

which would copy a C: command to the RAM disk. It can be used with the wildcard options though, for example:

```
copy c:#? ram:
```

will copy the entire contents of the C: directory into the RAM disk, or:

```
copy df0:#?.info ram:
```

will copy all info files from the internal drive into the RAM disk. If you want to copy all the subdirectories in a path as well, the option ALL should be specified at the end, like this:

```
COPY work:images Ram: ALL
```

will copy all the files in the images directory and all the subdirectories contained therein.

DELETE

This is obviously used to delete files. It should be used with care as there is no corresponding UNDELETE command in AmigaDOS.

DIR

This command will give a list of the files in the current directory. This command will also work with the ALL switch to give a complete list of all the files in subdirectories as well.

EXECUTE

If you have a script (a list of AmigaDOS commands in an ASCII text file) then this is the command to use to execute them. For example:

```
Execute s:user-startup
```

will execute the list of DOS commands contained in that file.

FORMAT

This is the DOS equivalent of formatting a disk through Workbench. The syntax is complicated, but it is useful because you won't be able to type it by mistake.
An example:

```
FORMAT DRIVE DF0: NAME plop
```

ICONX

This file is never used direct from the CLI, but is used as a tool in the Icon information window of a script. IconX allows script files to be executed direct from the Workbench.

INSTALL

This command is used to make a disk bootable. Ordinary Amiga disks are not bootable, but if you want to make your own startup disk you can with Install. Note that the disk may boot up, but you will also need to put a few directories on the disk and a startup-sequence if you want to be able to do anything, otherwise it will just boot into a CLI window. The syntax is simply:

```
INSTALL df0:
```

LIST

The list command performs the same functions as DIR, but it also displays the files size and the settings of the protection bits. It is possible to use the same parameters as with DIR, for example:

```
List work: ALL
```

will list all files in work: and its subdirectories.

LOADWB

This command is usually only used as the final entry in the Startup-sequence. It instructs the Amiga to initialise the WIMP Workbench software.

MAKEDIR

This is used for creating a directory. The directory will be a subdirectory of the current directory.

NEWSHELL

This command, and `NewCLI` will open up another Shell environment. The difference between the Shell and the CLI is that the Shell supports many extra features, such as a scrollback of commands (try using the up cursor to scroll back through previous Shell commands) and cursor line editing. Generally speaking, you're better off with Shell.

PATH

This is a very useful command. When you enter a command, AmigaDOS checks certain directories, including the C: directory and the System: directory. You can add a path onto this checklist by entering:

```
Path ram: add
```

This means that AmigaDOS will also check for commands in the RAM disk.

RENAME

This command simply renames a file. For example:

```
RENAME plop oldplop
```

would effectively delete the file 'plop' and recreate it in the same directory as 'oldplop'. Note that you cannot rename and move a file simultaneously with this command.

RUN

This command is similar to execute, except that a new Shell window is not opened for the script, it just runs in the background.

SEARCH

This command can be used to search for text in a text file, but more usefully it can also find a file on a device. For example:

```
SEARCH work:images/ "Marcus" FILE ALL
```

would search for a file called Marcus in the directory specified or in any subdirectory.

There are many more commands that you can execute from the CLI. Most programs and utilities can be run direct from the Shell rather than through Workbench. To check the parameters of these commands it is often useful to run them with a '?' argument like this:

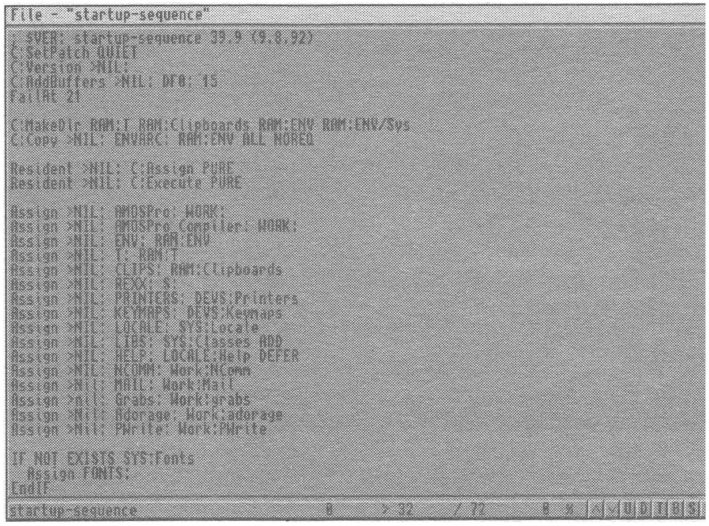
```
COMMAND ?
```

This will return useful information about the command. As always, the best way to learn is to experiment. Remember to work on a backup of your Workbench disks.

>NIL: DF0: 15
AM:T RAM:Clipboards RAM:ENV RAM:ENV
L: ENVARC: RAM:ENV ALL NOREQ
>NIL: C:Assign PURE
>NIL: C:Execute PURE
>NIL: AMOSPro: WORK:
>NIL: AMOSPro_Compiler: WORK:
>NIL: ENV: RAM:ENV
>NIL: T: RAM:T
>NIL: CLIPS: RAM:Clipboards
>NIL: REXX: S:
>NIL: PRINTERS: DEVS:Printers
>NIL: KEYMAPS: DEVS:Keymaps
>NIL: LOCALE: SYS:Locale
>NIL: LIBS: SYS:Classes ADD
LOCALE:Help DEFER

STARTUP

STARTUP-SEQUENCE



Editing your startup-sequence need not be as tricky as you think. All it requires is an ASCII text editor – and there is one supplied with Workbench.

The first thing that happens after your Amiga has performed its initialisation checks, is that it looks for the startup-sequence. This is an ASCII text file which is found in the S: directory of your startup disk, usually your Workbench disk.

The startup-sequence is really just a script – a list of commands which are executed in sequence. This is a very important part of your operating system, because it will affect the way your machine operates. The first couple of commands in the startup-sequence will call patch routines which correct minor errors in the ROM and set up the devices, buffers and default directories for many Workbench operations. They will also set up your system preferences.

Changing the sequence

You can have a look at the startup-sequence on a copy of your Workbench disk by entering the CLI and typing:

```
ed s:startup-sequence
```

Many of the commands may not make much sense to you, but they are all actually AmigaDOS commands that you can type in to the CLI at any time. You will find the commands in the C: directory of your Workbench disk, and if you want to know a bit more about them, you should get hold of the *Amiga Format Pocket Workbench and AmigaDOS* reference book, advertised in this issue of *Amiga Format*.

You can add your own commands to the startup-sequence if you like, just by typing them in (on a new line) and saving the startup-sequence (escape, x and return from ED) over the existing one.

It is quite important to enter the commands correctly, because if there is an error you will terminate the startup-sequence before Workbench is loaded and you will only be able to continue by entering commands manually.

If this happens you can load Workbench as usual by simply typing in the command:

```
Loadwb
```

and pressing return. Once Workbench has loaded you will then be able to re-edit the startup-sequence and correct the mistake.

User startup

There is another startup-sequence on most versions of Workbench called the 'user-startup'. If this file doesn't exist you can create one simply by typing:

```
ed s:user-startup
```

in the CLI. It is much better if you enter the commands you want to perform in this file. Then if it becomes corrupt or causes problems, it can simply be deleted and your machine will boot up normally.

The most common addition users want to make is an assign. The assign command is explained in the CLI section, but briefly, what it does is create a logical device, so that when AmigaDOS or a requester is asked to look for that par-

ticular device, it can be directed to a certain disk or even a directory on that disk.

You can also run programs, such as Virus checkers, direct from the startup-sequence, but in the days of Workbench 3.0 it is much more preferable to simply put the icons for these programs in the WBStartup drawer, and they are executed at startup anyway.

However, you should be aware that the programs in the WBStartup drawer are only executed after Workbench has finished loading and set up all the preferences, so you may want to include programs that need to set up before loading Workbench in the startup-sequence or user startup files.

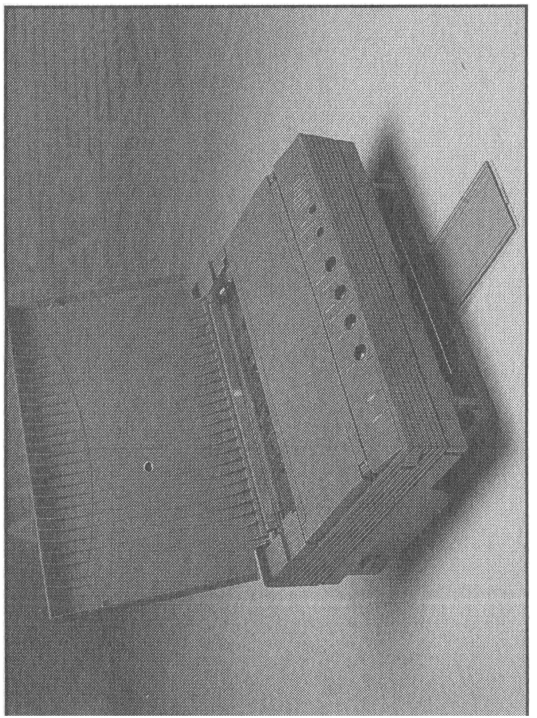
Probably the briefest, useable startup-sequence would be the following:

```
Setpatch
path SYS:system SYS:tools RAM: C: SYS: add
Assign ENV: RAM:
Assign T: RAM:
LoadWB
Endcli
```

If you were feeling very adventurous you could have a multiple selection startup-sequence with a question:

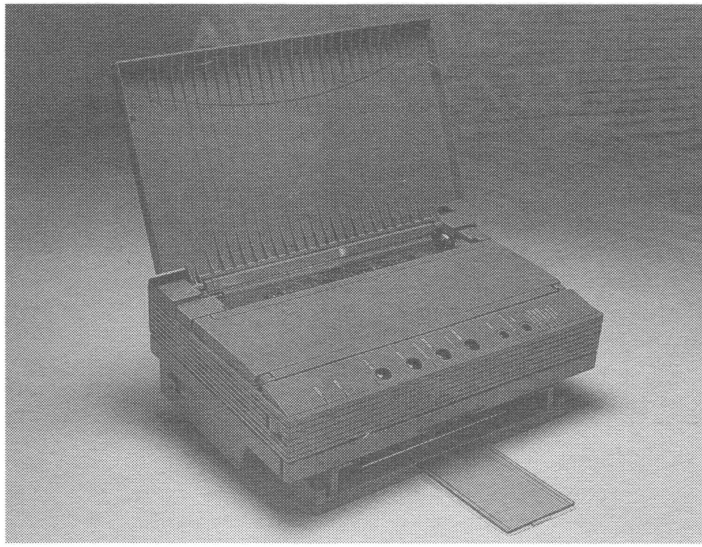
```
Ask "Do you want to run assigns Y/N?"
If  warn
Assign Work: Hd0:Programs
Assign Images: Work:Dpaint/pictures
Endif
```

The 'warn' just checks the error level of AmigaDOS, which is set to a warning by a 'Y' response on the keyboard.



PRINTERS

PRINTERS



Printers are quite expensive and should last you a lifetime, so it's a good idea to make sure you get the right one to begin with.

One of the most important purchases you will make, apart from your Amiga, will probably be a printer. Over 70 per cent of Amiga owners have one, and as the printer itself can cost as much or more than your computer, it is something which must be chosen with care. Here are a few notes to help you chose and set up your printing device.

Which printer?

Before you even start looking at different makes, there is a bewildering range of printer types on the market. All printers are most definitely not the same, in features or in price, so let's see what's available.

Dot matrix

The dot matrix printer was the first truly affordable printer, and many people still swear by them.

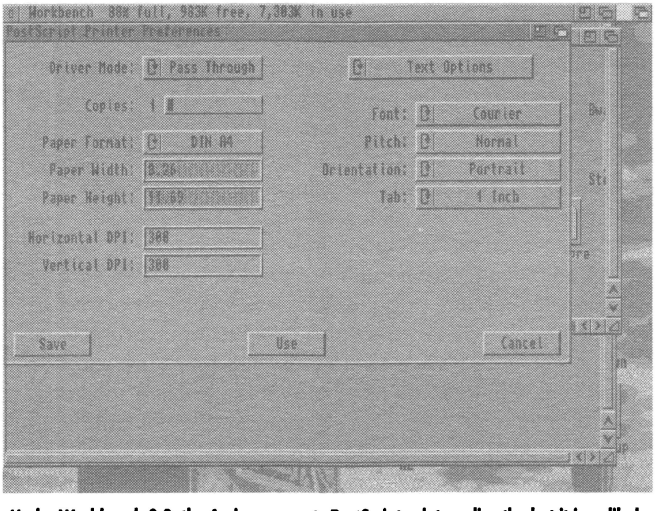
A tiny print head made up of electromagnetically operated pins strikes the paper through an ink soaked ribbon. It's hardly hi-tech, but it works very well and has done for some time. The inked ribbons are the most cost effective way of outputting your work on paper, and probably the most environmentally friendly, since the ribbons can be re-inked.

Modern dot matrix printers come in two flavours: 9-pin and 24-pin, and obviously the more pins your printer has, the better the overall quality of the printed letters, and also the greater resolution of greyscale graphic output.

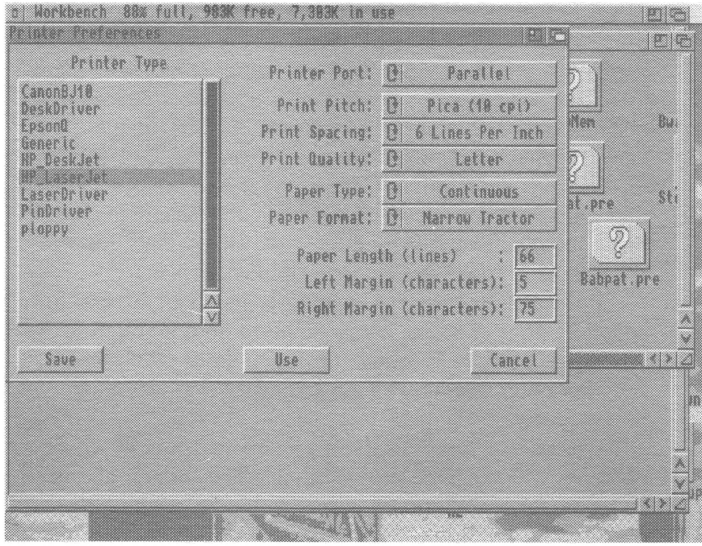
Dot matrix printers are quite fast, although you pay for speed in terms of noise. If you intend to do a lot of printing, you would be wise to invest in a sound-proof printer hood to keep the noise down, or at least to invest in a very loud stereo system.

Graphics output from these printers is generally disappointing, with common problems including 'banding' and lack of resolution. Banding is caused by the print heads overlapping or leaving gaps between successive rows of print. This is a problem with the whole process of dot matrix printing, although some models manage to overcome it to a great extent.

For general word processing work, though, dot matrix



Under Workbench 3.0, the Amiga supports PostScript printers directly, but it is unlikely that you will need (or be able to afford) one.



Printer drivers are selected through the Workbench preferences system. You must have the correct driver or the output may be erratic.

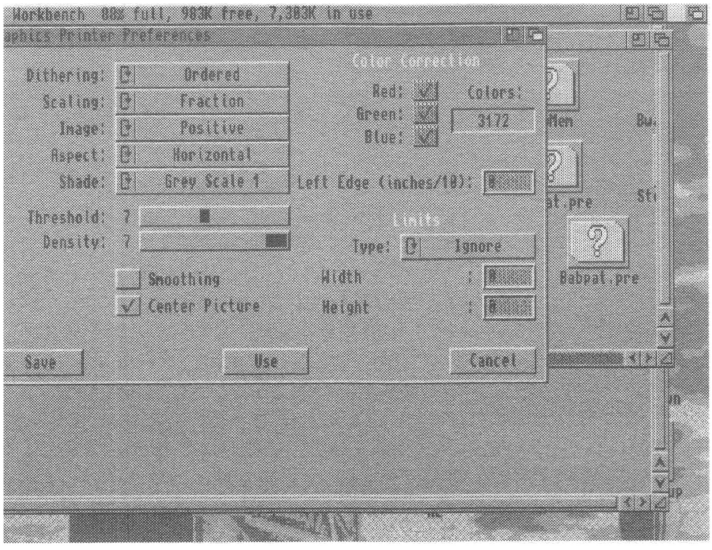
printers are ideal, as their low price, high reliability and speed are features not to be scoffed at.

Ink jet/bubble jet

Bubble and Ink jet printers are starting to become cheaper and cheaper, which is only good news because their output quality is excellent. Most printers will output at 360DPI (the same or better as laser printers) and given the right paper, it is hard to tell them apart. Graphical output is good to acceptable, especially with some of the custom printer driver software – such as Turboprint, free with *AF*51.

A combined print head/ink cartridge squirts tiny drops of ink directly on to the page, and as you would expect these printers are very quiet. They also compact and consume very little power, so battery powered ink jet printers are common – worth considering if you need a portable printing solution. They also tend to be small even compared to dot matrix printers, never mind lasers, so they are ideal for situations where there is not a great deal of desk space.

These printers are an excellent choice for general use as well as small-scale desktop publishing. If there is one snag



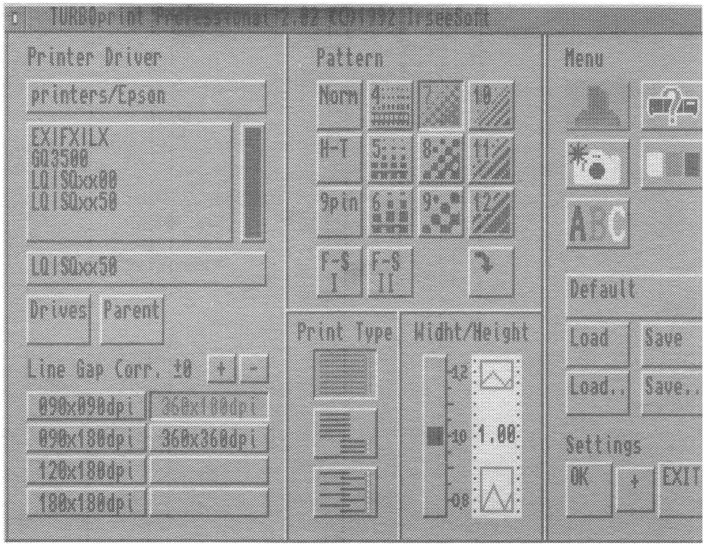
Graphics preferences should be considered carefully. The best options can vary depending on the nature of the image you are working with.

it's that all types of paper are not suitable, so careful selection will be called for. The wrong choice of paper can lead to bleeding of the output, where the ink has drifted before drying. This results in unreadable text and very poor looking graphics. The output resolution of a bubblejet is actually superior to that of a laser printer (360 dpi) but the quality is not quite as good in most cases, simply because of the slightly random method of putting ink to paper.

Laser/LED

Laser printers are large boxes that produce buckets of ozone and the best possible quality output. Most printers are compatible with the HP Laserjet, so getting the right software drivers isn't usually a problem. Workbench comes with a Laserjet driver which seems to work fine with just about every laser printer ever made.

The running cost of a laser printer can be considerable, for several parts (toner cartridge, drum) need regular replacement, and this won't be cheap. If you buy a common make, some of the costs can be reduced, because there are a few cartridge replacement schemes in operation whereby the



Software like TurboPrint can dramatically improve the results of your printouts. It was given away on the Coverdisk of *AF* issue 51.

used toner cartridge is refilled and resealed instead of just being thrown away.

LED printers give similar results to laser printers, but usually produce less in the way of noxious gases. (Actually I'm exaggerating about the gases, but I had to sit next to one for a year and it's given me a bad impression of them.)

PostScript

PostScript isn't a make or type of printer, rather it's a standard programming language. A programming language for printers? Don't be so surprised – most laser printers have a 68020 or better microprocessor inside them. PostScript is a page description language, and it can simplify the task of sending complicated documents to the printer. It's really only worthwhile getting a printer with PostScript compatibility if you are heavily into desktop publishing.

PostScript printers are a great deal faster under normal operation, because the text is transmitted just as character data with the font name and size. In a normal printer, where each individual dot of information has to be sent from the

Amiga, the fonts have to be first rendered in the computer before and then all the data has to be sent down the cable to the printer. Workbench now directly supports PostScript printers for normal use, although Amiga DTP software such as *Professional Page* and *Pagestream* has actually supported them for some time indirectly.

The colour option

Most of the printer technologies currently available also have a colour option. With dot matrix printers this requires a special ribbon with the primary colours on it (cyan, magenta, yellow and black), and inkjets require a special cartridge.

The output is far from perfect if you are printing digitised pictures, but text and diagrams come out clearly. The problem is that the ribbons don't last very long. Although they may still contain plenty of ink, after a few passes the different coloured parts of the ribbon become contaminated by the print head introducing foreign colours. The result is that after some heavy use, everything comes out brown.

More expensive printers are available, but they cost an absolute fortune and none can produce output as good as photographs or professional colour printing such as *Amiga Format*. Probably the most sensible option is the Canon BJ600C, which has a decent resolution and can output fairly good colour graphics. Colour inkjet and laser printers can also be used to output on to acetate – very useful for creating overhead projector transparencies.

If you need colour, the best way is to create your work in a DTP package, save it on to a PC format disk in PostScript format, and get a bureau with a Mac to output it to film for printing or directly to one of the Canon PostScript photocopying machines. If you don't understand that last sentence then you had better go to somewhere like ProntaPrint and have them explain it to you. Some bureaux will require the files in different formats or on different disks, so it's always best to check first.

Cabling

The Amiga transmits data to a printer via the industry standard Centronics style, which means any PC cable will suffice. The only snag is that the Amiga provides some extra powerlines, so if in doubt get an Amiga-specific cable. Most dealers will supply a suitable cable when you buy a printer – if they don't, they are tight old skinflints. Shops such as Virgin usually keep a selection of specific cables in stock.

Some printers are available which use the RS232 serial port instead. These can be handy if your printer port is already tied up with

HINTS AND TIPS:

● When setting up a printer, always make sure that both the computer and the printer are disconnected from the mains. Never plug in the connector to the Amiga with the computer switched on, or you'll probably damage a chip.

● Sometimes the highest resolution output of the printer is not always the best.

● There is more than one greyscale dither mode. Experiment with them all for the best results, although an ordered dither is usually best.

● Dot matrix printers can be used to transfer images on to T-shirts. All you need is a special ribbon (available from Care Electronics) which contains ink that can be ironed-off the paper and on to a shirt. Remember to reverse the image before printing!

● If you do not have a printer yourself, but know a man who does, you can print files direct to disk for printing out later. To do this you need to enter the CLI and type:
`CMD parallel ram:output`
Then you can print out as normal. A file will be created in the RAM disk which you can copy on to a disk. When you are set up on another machine, you can print the file out again by entering the CLI and typing:
`copy output PAR:`
Remember that the driver used to create the file must be one that is compatible with the printer used to output it.

a sound or video digitiser, but remember that they will be an awful lot slower, as the serial port only sends one bit of data at a time instead of eight. You will also need a different cable to connect it to your Amiga.

Software

In order for your Amiga to use a printer, a special piece of

software called the Printer Driver is required. The Amiga comes with dozens of drivers, and they are all accessed through the Preferences program on the Workbench.

Normally you will need to select the correct driver for your software, and if you are lucky you will have a printer whose name appears in the list. Of course, it almost goes without saying that this doesn't always happen although with Workbench 3 most of the printers you could buy today are covered.

Some suppliers, such as Silica Systems, always supply a special Amiga printer driver so check when you are ordering. All manufacturers produce drivers, so if you get stuck telephone their customer support line. If you can't track down a suitable driver, try the Epson variety as nearly all printers support this standard by default.

Whenever you make use of the 'print' option in a program, such as in *Deluxe Paint*, the Amiga's operating system will load the printer driver and use it to send data to the printer. Remember to set up both the printer driver and your graphics preferences before you print.

It is a good idea to look in on your graphics preferences every now and again. Different images may require different settings for the best results. You can create a library of these settings and store them for later use if you want. Hold down the right mouse button and you will see that the preference program has a few menus. One of these is 'save as', so your settings can be saved under a different filename (that is, not used as the default option). Anytime you want to use those settings in the future you can just load them in, using the load option in the preferences menu.

Extras

If you are planning on using your printer a lot, you should consider getting a feeder tray (if the printer does not come with one as standard). They hold about 50 pages at a time, and will save you a lot of bother when you are printing a long document. If you are printing out long listings it may be worth considering a continuous sheet option. Continuous paper is the stuff with the little holes on the edges.

Continuous paper does not require a sheet feeder (because it is all one big piece of paper), but it does require

a tractor feed to pull the paper through. A tractor feed means that you don't have to hang around feeding the paper in one sheet at a time. It also means that you save paper, because there are no top and bottom margins left blank.

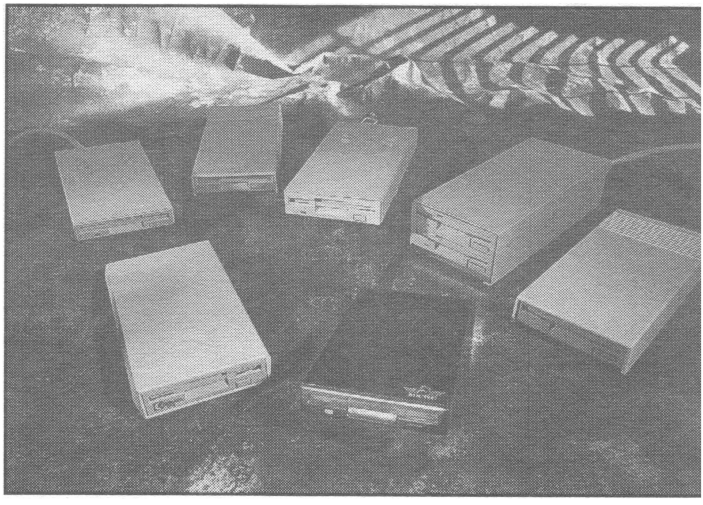
A switch box will also save you bother – and wear and tear – if you find you are constantly plugging and unplugging in cables. With one switch, you can connect your Amiga to the printer, your sound sampler or even your network. Switch boxes designed for the PC should work without problems on the Amiga, although you should make sure that all the pins are carried through because the Amiga supplies power on an unused pin.

Refills

Are you green? Or are you just unwell? Why not help conserve the environment and save yourself a few pennies into the bargain, by using refills. Next time your ribbon or inkjet cartridge runs out, don't by a new one – get a refill kit. Typically a refill will cost you half the price of the new kit, and will probably last longer as well. There are refill and re-inking schemes for just about every type of printer, including laser cartridges, bubblejet cartridges and dot matrix ribbons. It is worth enquiring about this in the shop where you buy your printer.

FLOPPY DRIVES

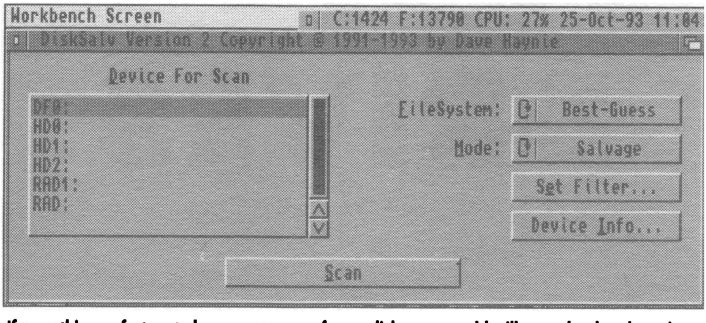
FLOPPY DRIVES



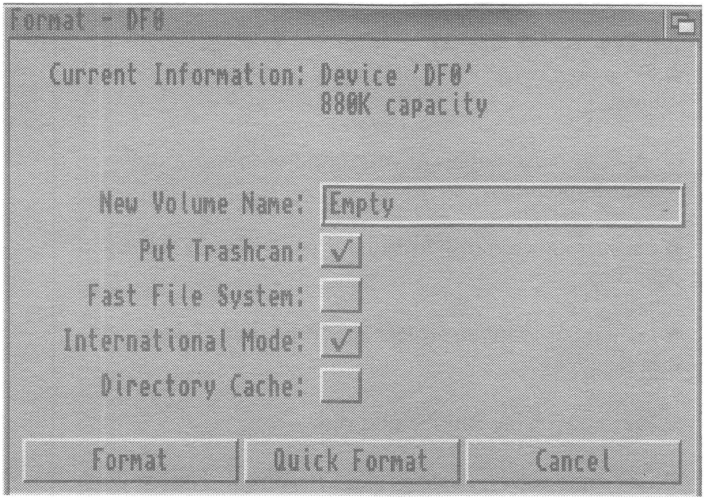
A brief selection from the wide range of external floppy drives currently available for the Amiga. Believe it or not, they are not all the same.

If you can't yet afford a hard disk for your Amiga, the very least you should do is invest in an external disk drive. The Amiga supports up to three drives, which are added on via the special drive port at the rear of the Amiga.

The first drive you add to this chain will be known as



If something unfortunate happens to one of your disks, you could still save the data by using a recovery program such as *Disksalve* or *FixDisk*.



Formatting a floppy disk used to be hard work, but thankfully Commodore have made it incredibly easy under Workbench 3.0

DF1:. This is important to remember, because it is easy to get into the habit of referring to everything as DF0. When you have two drives, it is a good idea to boot up on Workbench on the internal drive, and use the external drive for any data or program disks. This means that you won't have to keep swapping the Workbench disks around, and it will also save wear and tear on the internal mechanism.

On the A1200 and A4000 you can select which drive to boot up from. Just hold down both mouse buttons when you start up your machine. From the Boot menu you can select the drive to boot up from. This isn't very useful unless your internal drive is not working properly. This can cause problems, as some badly written software demands to access its program disks in DF0:

You can get around this most of the time by using the assign command from the CLI:

```
ASSIGN DF0: DF1:
```

will do the trick, but obviously you will have to boot up into Workbench first, so this won't work with many games.

HINTS AND TIPS:

- Store your disks neatly and away from magnets or heat sources.
- Always make copies of your original software disks whenever possible.
- Never remove a disk from the drive while it is still being accessed.
- Remember to Write-protect important data disks to prevent accidents.
- Never touch the surface of a disk.
- Get some salvage utilities like *Disksalve* or *FixDisk* (both available from Public Domain libraries) so that all mistakes need not be fatal.

There are many different types of external drives available nowadays. Some have track displays built in, but this isn't a particularly useful feature. Some come with built-in copying hardware, for making backups of copy protected disks. These can be useful, but make sure they are your own, legitimately purchased disks that you create backups of. It is illegal, not to mention quite stupid these days, to create copies for your friends.

One drive to look out for is the Power Computing XL drive, which has a high density mechanism, enabling you to read and write disks with a capacity of 1.6Mb, or 1.44Mb PC compatible disks (through the *CrossDOS* software). Power Computing also distribute a number of Dual drives, which add on two extra drive units at a slightly reduced cost. Most people seem to get by with just one extra drive, though.

HARD DRIVES

HARD DRIVES

Having a hard drive attached to your Amiga will change your life dramatically – and hopefully for the better.

It won't be long before you realise that your machine would work a whole lot better if only you didn't have to keep changing disks every five minutes. Aside from wearing out your disk drive and giving you a rather embarrasing pain in the wrists, it does tend to get in the way of getting things done.

Even Workbench has difficulty in functioning properly from a floppy drive – not just because floppy devices are so slow, but simply because there are more files required to run the operating system than can comfortably fit on one disk.

But do not despair. The A1200 and the A600 computers hide a dark secret inside their compact cases, for if you were brave enough to open them up (and therefore invalidate your warranty) you would find a small 44-pin connector. This connector is an IDE interface – jargon which means that any IDE compatible hard drive can be plugged straight in.

Fitting a drive isn't difficult even if you are only reasonably skillful with a screwdriver, so here is a short step-by-step guide to how to do it:

1. First you should make sure you have all the parts you will need to hand. This means you will have a 2.5-inch IDE drive, a suitable cable, four mounting screws and a crosshead screw driver.

2. Unplug everything from the Amiga, and place the computer upside down on a clean towel placed on top of a well-lit table.

3. Remove all the fixing screws, including the one hidden under the warranty sticker. There are two screws towards the rear which hold the disk drive in place. It is not necessary to remove them, but don't worry if you do. Try to remember which screw came from which hole, as they are not all the same size or type.

4. Turn the computer over, and unclip the top of the casing. You won't be able to remove the lid completely because of some coloured wires, but you can move it gently to one side.

5. Move the keyboard slightly to reveal the drive bay – a small metal construction which will clip free from the circuit board.

6. Fit the drive into the bay, using the four mounting screws to keep it in place. Don't over tighten them.

7. Now the cable needs to be attached between the Amiga motherboard. You should be able to see a number 1 printed on the circuit board. Connect your cable so that the wire with the red strip is closest to the '1'. Make sure all pins fit into the socket properly.

8. Fit the lead to the drive, you don't need to twist the cable. Power is supplied with all the other wires, so you won't need to make any more connections.

9. Reassemble the computer, clipping the lid into place at the back.

10. Power-up: you should hear the drive making whirring

noises. If you don't, immediately switch off your Amiga and check your wiring.

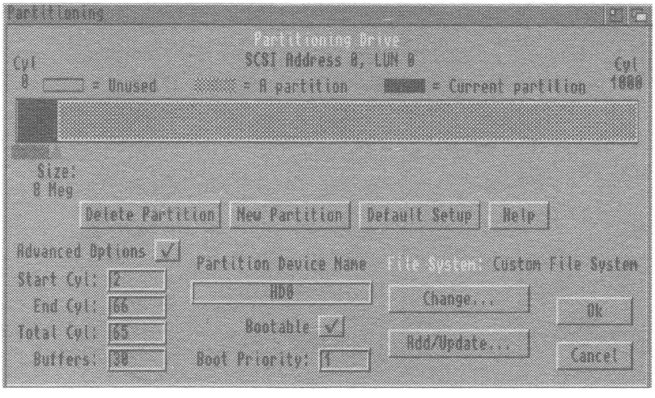
11. Unless your drive was supplied already prepared, you will need some special software to 'prep' it. Suitable software is available from Public Domain libraries. Although rather convoluted, this software will prepare your software for normal use. Here's what you need to do:

a) Define the drive type (most software will read the data directly from the drive). This includes not only the actual model of drive, but also the number of heads the drive has, how many cylinders per track there are, and so on. Without this information there is no way that the drive can be reliably used. If the software cannot read this information from the drive then the drive is probably broken anyway.

b) Choose how to partition the drive (typically, 4Mb is enough for Workbench, leaving the rest for normal applications and data files).

c) Make the Workbench partition bootable. In *HDToolbox* there is a little check gadget for this.

d) Save the changes to the drive.



***HDToolbox* is an excellent utility for preparing your hard drive. It is supplied with Workbench3.0, but only with the A4000.**

HINTS AND TIPS

● Buy the biggest drive you can afford. An 80Mb drive might seem huge, but you can fill one within a week if you try hard enough.

● Buy some backup and utility software at the same you buy your drive. Hard drives are by no means infallible, and need to be treated with respect.

● Shop around, and check the make of the hard drives you are offered. When you buy your drive, ensure the cable and prepping software is supplied.

● Never, ever, ever, ever perform a low level format on an IDE drive. You will break it.

e) Reset your machine, and boot up from the floppy drive again.

f) Select the hard drive icon and perform a QUICK, Fast File System AmigaDOS format.

g) Now your drive is ready for use!

Suppliers

If all these instructions sound a bit tricky, many suppliers can sort you out with all the hardware and software you need – or even fit the drive for you. Check the advertisements in magazines, or try the following:

Mediasource (0247 471882),
Phoenix (0532 350652)
Software Demon (0736 331039)
Trilogic (0724 691195).

Maintenance

Your hard drive should serve you long and well. There is no reason to suppose that it won't outlive your computer. But there are occasional problems which can occur and you should be aware of them.

If something unfortunate happens to a floppy disk, it does not cause much inconvenience to bin it and format another one. However, if this happens with a hard disk, unless you are the Sultan of Brunei, you will probably want to fix it.

No matter what is wrong with your drive, you should never, ever dismantle the drive mechanism itself. The drives are assembled in clean dust-free environments, for the simple reason that the disk heads float only just above the surface of the disk. Even something as small as human hair or a particle of smoke will can get stuck between the head and the surface, potentially causing irreparable physical damage to both. It is very unlikely that any physical damage will occur on your drive as long as it remains safely inside your Amiga and doesn't go on holidays to the seaside.

A common cause of disk error is when the computer crashes during the middle of a disk operation. If a program crashes and you get a software failure requester, make sure that no applications are using the disk before you power down or reset. If you don't get the option and the computer just fails anyway, the file in question is likely to be damaged.

More importantly, the disk bitmap may be damaged. This is the area of the disk which tells AmigaDOS which disk blocks are in use and which ones are empty. Fortunately AmigaDOS can tell, by using a checksum, when the bitmap is invalid and will prevent you from writing any data to the disk at all to safeguard any data. This is all very well, but how do you get the drive working again?

Luckilyy, under later versions of AmigaDOS these problems are fixed automatically. You may notice the disk taking a very long time to boot up, and the access light being almost permanently on for a time while the problem is sorted out. If this doesn't happen then you need to run a disk recovery utility. There are several of these, and I suggest you get hold of Issue 53 of *Amiga Format* where these problems were explained more fully, but the recommended utilities are *FixDisk* and *Disksalve*, which are both available from PD libraries, or *Quarterback Tools* or *Ami-Back Tools*.

These latter two can also perform other tasks. As well as undeleting files which you may have accidentally erased, and editing the binary data on the disk blocks themselves. They can also improve the performance of your drive by optimising

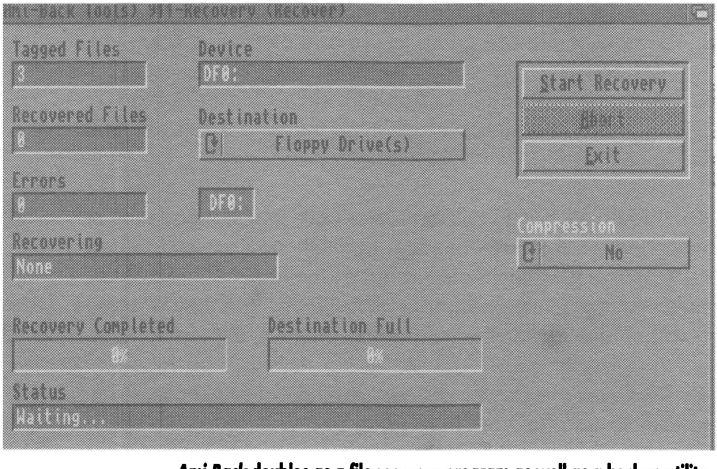
it. When you use your drive a lot, when files are constantly being created, deleted and updated, the empty blocks on the disk become used up. Very quickly, this means that a file cannot be saved in a continuous space on the disk. When the drive is asked to read the data back again, the drive heads have to search back and forward across the disk. This slows down the access speed, in some case dramatically.

The only way to sort out this problem, short of reformatting the drive, is to defragment it. The two utilities mentioned above will shuffle all the blocks on the drive around until they are straightened out.

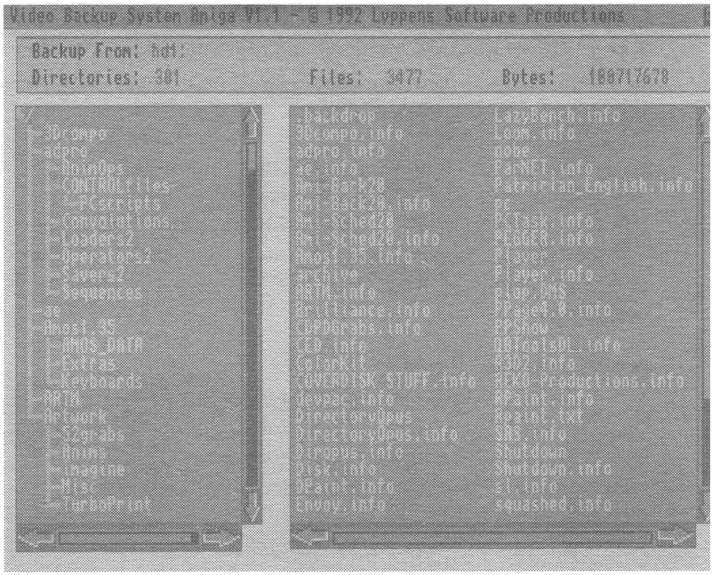
Backing up

There are two popular backup utilities for the Amiga: *Quarterback Tools* and *Ami-Back*. A backup utility will enable you to secure your data by copying the selected contents of your drive on to another medium, such as floppy disks or magnetic tape.

This is really the only way to make sure you never lose any data – always keep a copy. It is a good idea to get into the habit of regularly updating your backups, and *Ami-Back* is supplied with a scheduler program to remind you of this.



***Ami-Back* doubles as a file recovery program as well as a backup utility.**


Video Backup System Amiga V1.1 - © 1992 Lyppens Software Productions
Backup From: hd1:
Directories: 301
Files: 3477
Bytes: 1007(7678

The Video backup system is an unusual, but effective, way of making sure your data is safe. It stores files on normal video tape using a home video recorder and a special cable.

There are some more important facts you should know about hard drives if you are going to use and own one:

● There are two main types of hard drives for the Amiga – SCSI (Small Computer Systems Interface) and IDE (Intelligent Drive Electronics).

● SCSI drives have intelligent interfaces which mean they rely much less on the host computer to tell them what to do. In contrast the IDE mechanism requires the host CPU to hold its hand through most operations. This means that they are quite fast, but also makes the interface a bit more expensive.

● IDE drives are slower because the host computer's CPU has to do some of the work in reading and writing to the disk. They are cheaper, though.

● The SCSI interface is much more versatile than IDE. As well as simple disk drives, various other devices such as magneto-opical disks, tape streamers, scanners and CD drives can be added on to a SCSI bus.

● In general up to seven SCSI devices can be added to a single SCSI interface, by daisy chaining the devices. Usually only three devices can be added to an IDE interface.

● The A4000 has an IDE interface and an IDE drive installed. Commodore have configured the driver for this inteface so that it treats the drive as a SCSI device (for better software compatibility) but this does not mean that you can add SCSI devices directly to this interface.

● The most popular external drive for the A500/A500+ was the GVP HD8+, which was a SCSI drive. It also allowed the user to add extra memory.

● Commodore produced their own hard drive for the A500, which was imaginatively called the A590. This also allowed extra memory to be added, but although it had a SCSI interface it was quite slow, because it actually contained a modified XT drive.

● Hard drives can be partitioned, which means that although you may only have one physical device, it can be treated as a number of different drives by your Amiga. This is very useful when you have a large disk (otherwise it could take an age to load directories). You will have to reformat your drive after re-partitioning it.

● A quick and easy way to speed up your drive is to use more buffers. The buffers act as a temporary storage for data as it passes between the drive and the CPU. You can add more buffers by using the 'Addbuffers' command from the CLI. For example:

```
Addbuffers Dh0: 100
```

will add 100k of data cache to the dh0: device. Obviously this does eat up memory, though.

● Partitioning drives is also useful should something nasty go wrong. If a faulty program or unfortunate guru incident destroys all the data on one partition, the others will most likely still be usable.

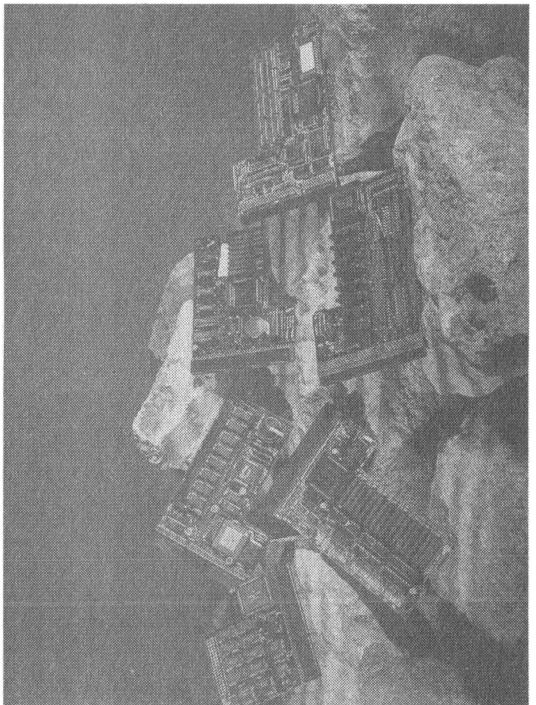
● It is a good idea to get some sort of hard disk utility when you get a hard drive. *Ami-back Tools* or *Quarterback Tools* are very good.

● A great deal of speed can be gained by using the new file systems available under Workbench 3.0. Directory cache mode means that you won't have to wait half the normal time for all the icons to appear in a disk window. However, these modes are incompatible with earlier versions of Workbench.

● You can check which version of AmigaDOS was used to format your drive using the CLI command 'Version'. If you type:

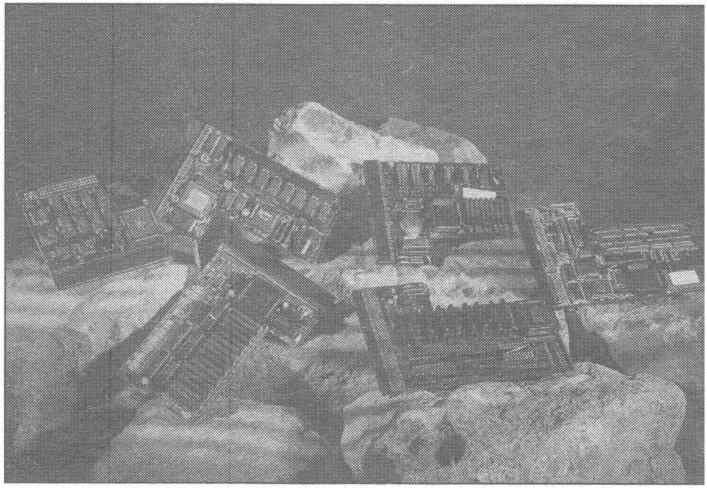
```
Version dh0:
```

A number will be returned. This is the version number of the Workbench used to format the drive. Although the drive should still work, it is a good idea to have your drive formatted with the same version of Workbench that you are currently using.



MEMORY

MEMORY

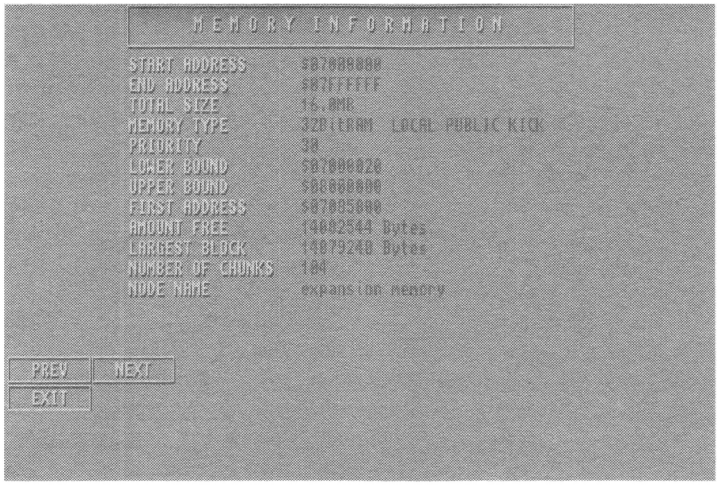


A small selection of the RAM expansions available for the A1200. Many include extra options such as FPU units or SCSI controllers.

There are two different ways in which your memory is used on the Amiga. Chip memory is interfaced to the DMA (Direct Memory Access) bus, allowing it to be accessed directly by the CPU or any of the custom chips. Because of this direct access, it is often slower than Fast RAM. Fast RAM can be accessed only by the CPU. The amount of Chip memory you can add to your Amiga is determined by your Agnus chip. Older A500s can only access 512k of Chip RAM. Later versions of Agnus allowed 1 or 2Mb of Chip RAM to be added.

It is worth remembering that although most people think it is much better to have Chip RAM in preference to Fast RAM, this is not always the case. Although the Chip RAM is used for DMA operations and storing samples, Fast memory can speed up many of your Amigas operation. Even 1Mb is enough room for drive and device buffers that benefit greatly from being in Fast RAM.

The reason for this is that Fast RAM is only accessed by the CPU, so the processor doesn't have to wait around for the



Memory is organised in banks. This SysInfo display shows the Fast RAM bank of an A4000 with 16Mb of SIMs installed.

custom chips to have their turns with the RAM.

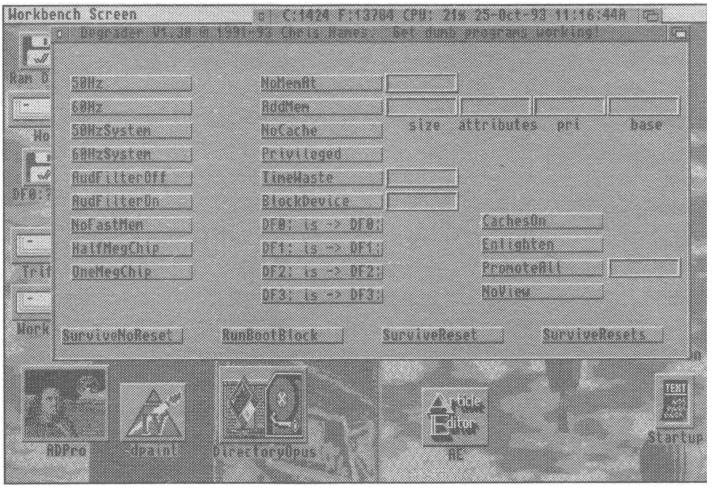
Device buffers and caches can be one of three types: Chip, Fast or Public. Thses days most buffers are defined as Public, whih just means that the system can use whatever memory it has to hand. In most cases this will be Fast RAM.

Chip RAM

All new Amigas are capable of having 2Mb of Chip RAM, which is fitted as standard. Older sound samplers and most art packages are limited by the amount of continuous Chip RAM they can access. This is because they use the graphics (Agnus or Alice) or the sound (Paula) chip's ability to address the chip RAM directly to perform some tasks.

Some utilities, either provided with Workbench or available from Public Domain libraries, help make the most effective use of your memory. The most useful of these is *FastMemFirst*, which forces programs to use Fast memory in preference to Chip memory. Another useful utility is called *Degrader*. This can effectively 'knock out' blocks of memory to make your machine more compatible with older Amigas.

All memory which is added externally to the Amiga is



The PD utility *Degrader* can be used to ease compatibility problems, which are often due to mem ory configurations.

Fast memory. There are many different type of Fast RAM expansion available, but most of them involve the trapdoor slot on the A1200.

Under the trapdoor

The trapdoor slots on the A500, A500+, A600 and A1200 are one area used by most third party manufacturers as a path to add expansion memory. Depending on which Amiga you have, vast amounts of memory can be added this way. Even the humble A500 can have 4Mb added in this way, although this does require some hardware modification.

RAM is usually added to the A1500 and A2000 by a Zorro card. Because of their versatile design, almost any memory package is catered for. The main types of memory packages available are DIPs (Dual In-line Package), ZIPs (Zig-zag In-line Packages) and SIMMs (Single In-line Memory Module). All have their advantages and disadvantages, but mostly the preference is dictated by which is currently the cheapest, due to fluctuating world demand.

Expansion port add-ons for the A500 and A500+, such as hard drives, often feature the ability to add extra Fast RAM. The Commodore A590 does so by way of DIPs, while the GVP HD8+ uses SIMMs. There are still a few memory

expansions available for this port. The best of which is probably the SupraRAM expansion, which can use a separate power supply and also has a through port to allow other units to be attached.

32-bits

Memory for the A4000 or the A1200 should be 32-bit wide memory, which is more expensive but much faster than the 16-bit memory used by older Amigas. There are a number of different memory expansions for the A1200.

Some of them feature extra components such as maths co-processors or accelerator chips. These are expensive but potentially useful options, as they will greatly increase the speed with which your computer is able to perform many operations.

Accelerator cards for the older Amigas often include the ability to add 32-bit RAM as well. This will greatly improve the performance of the machine. If this is your only RAM expansion though, and you also have a hard drive fitted, it is probably worth configuring at least some of the memory as normal Amiga Fast RAM. The reason for this is that the drive buffers on the older (non-AGA) machines, cannot be allocated to 32-bit RAM, becasue it doesn't fall into the standard Amiga memory map.

Speed

Memory itself can have different speeds. This can make quite a difference to memory intensive processing tasks such as animation and video work. Access times for an average memory device would be around 100ns, but specialist memory devices can be as fast as 20ns. This type of RAM is very expensive and is used normally in specialist devices like 24-bit display cards and video digitisers.

Generally, you will find that ZIP packages are faster than SIMM modules which are faster than DIP packages.

Faults

It is very unusual for memory devices to develop faults. Thankfully they are they type of things, like windows, which either work or don't work. The danger period is when you are installing or removing memory. The chips are very sus-

ceptable to static damage, so it is very important to earth yourself (by touching a radiator or earthed appliance) before touching the RAM card. In fact, if you can avoid it, try not to touch the actual memory chips at all.

If a fault does occur, the only thing to do is replace the chip. In a 4Mb SIMM module, this is an unfortunate occurance. Because of the way that the multitasking operating system needs to use memory in blocks all over the place, it may be some time before you are able to pin down the fault.

There are a few software programs that will check out the integrity of your memory, and they are usually supplied with the memory boards themselves. Note that although the PD program *SysInfo* will tell you how your memory is configured, it doesn't actually test it.

MONITORS

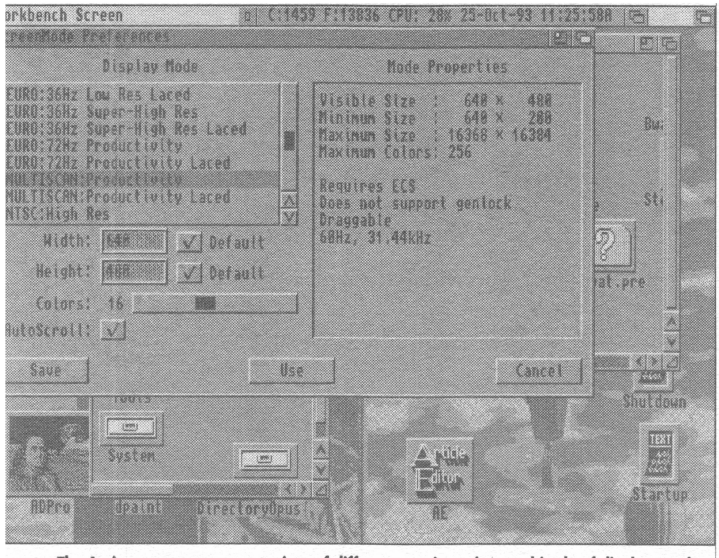
MONITORS AND DISPLAYS

A gaggle of monitors. They are not just expensive toys, they can greatly improve the quality o your life – as long as you get the right one.

A dedicated monitor is a very nice thing. Not only does it mean that you can use your computer when *Coronation Street* is on, but it also means that you can actually work out what is going on without ruining your eyesight. If you have been using the modulator output of the Amiga, you will probably not be able to see text clearly enough to work in a high resolution.

A monitor is just like a TV set, but without the circuitry to receive TV signals. Instead the signals must be supplied directly via a cable. Why then do they cost as much if not more than a TV?

A monitor is made to much more exacting standards than most televisions. For a start, TV manufacturers don't expect pictures to be displayed at a high pixel resolution – especially not when the signal carrying the picture information has been bounced off the outer atmosphere. Monitors are designed



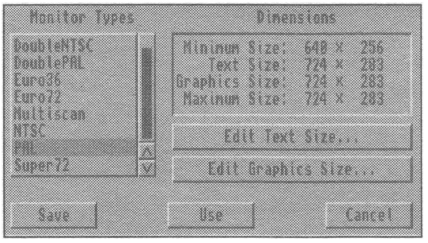
The Amiga can use a great variety of different monitors, in a multitude of display modes.

with high resolution displays in mind, though, so the phosphor dots are much smaller and more tightly packed. The result is a far superior image, where even a single pixel on a 1028 x 428 image can be seen clearly.

There are a number of monitors available for the Amiga. The best ones for the job are, surprisingly, the Commodore ones. The old 1084S is quite adequate for most needs, although it cannot display some of the screen resolutions (such as productivity mode) available to the newer Amigas.

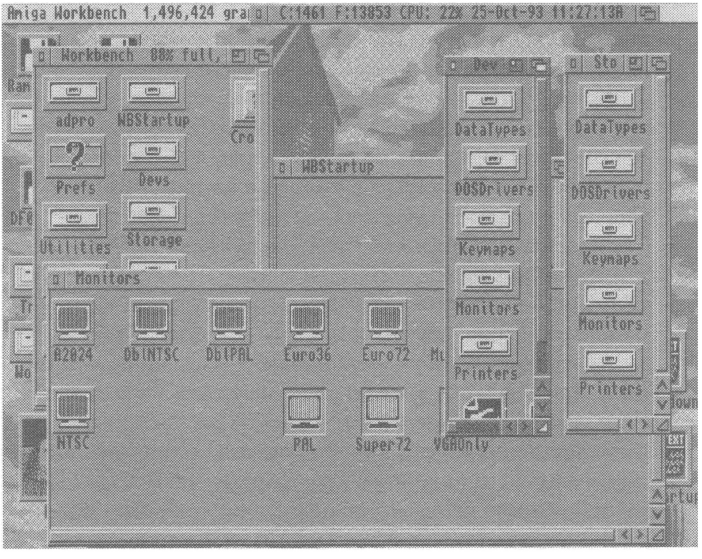
To support these new display modes, Commodore have produced a new monitor, the 1940, which also includes stereo sound. You may be able to get hold of a 1960 monitor, which can also cope with just about anything thrown at it. These do not have any sound capabilities, but since they are older models, many dealers are selling them cheap.

If you do not have a monitor and can't afford one, there may still be ways to improve your display. The A1200 also has a composite colour signal output. This composite signal can be accepted by many modern TVs, and produces a much clearer signal, because it is unmodulated. If your TV won't

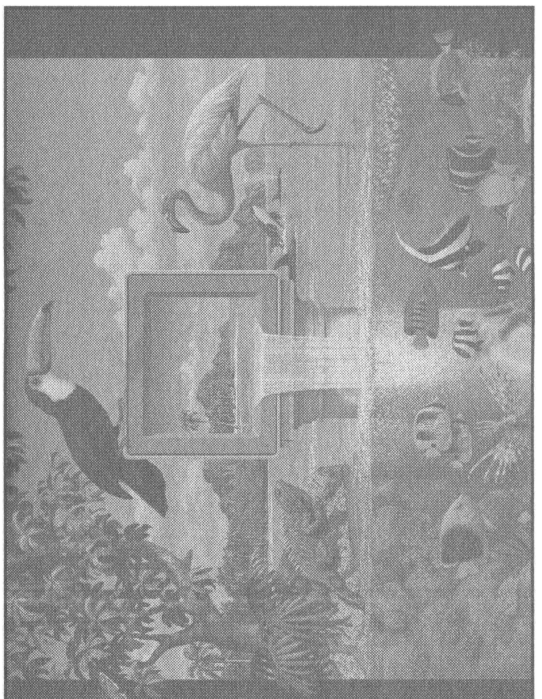


Your monitor type will affect the maximum resolution and overscan size of your display.

accept the signal, your video deck almost certainly will. Try looking up the manuals which came with them to find out where to connect this signal. The connector for the Amiga is a simple phono socket, as is the composite connector on most videos and pre-SCART TV sets. Your local electrical shop should be able to sort you out with the right cable.



Monitor types are stored on the Storage disk of Workbench. To use one, simply drag it into th monitor drawer in the devs: directory



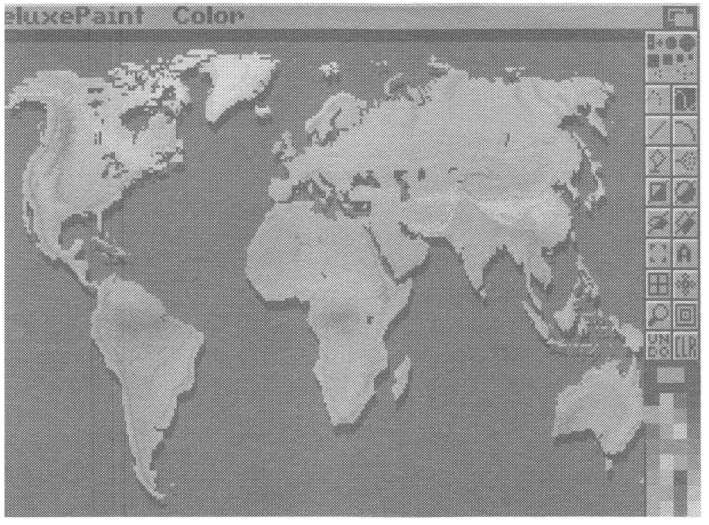
GRAPHICS

GRAPHICS

***Brilliance* heralds a new era of paint packages – ones that work internally to a 24-bit resolution and can display on screen using the AGA chipset's HAM8 mode.**

One of the most stunning features of the Amiga is its ability to display breathtakingly realistic graphics with no extra hardware. In the case of the A1200 and A4000 machines, the graphics capabilities go that bit further, with a HAM8 mode capable of displaying 262,144 colours at once. But where do all these colours come from and how are the images stored?

The standard file format for Amiga data is called Interchange File Format, or IFF. It is a standard which applies equally to text, graphics, sound and many other forms of data, but it is most commonly used to refer to Amiga graph-



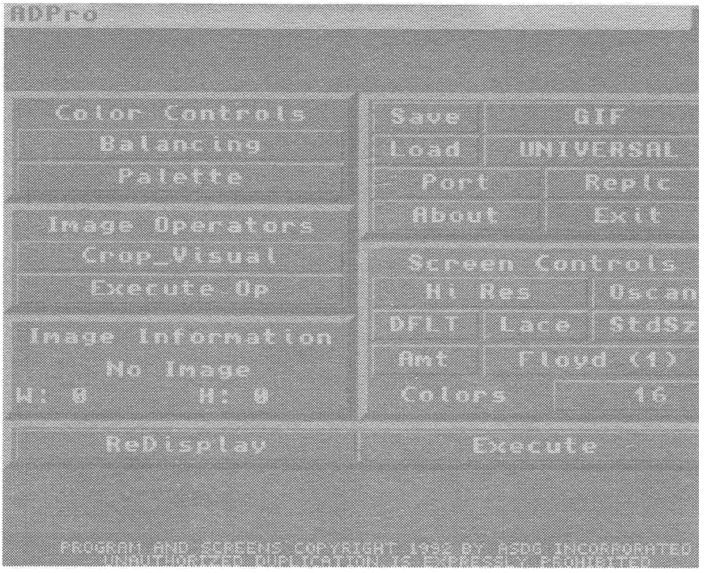
***Paint* is the closet thing there is to a standard Amiga art package. It was developed very early in the machines life, and its IFF image format was adapted as the Amiga standard.**

ics, because this was the first area it was used in. The IFF format was actually invented by Electronic Arts when they were developing *Deluxe Paint* for the Amiga.

Although the original file format dealt with a particular way of storing data, the standard has been expanded to include all the different graphic modes now available.

On the standard Amiga graphics are built up of a series of 'bitplanes'. Each bitplane is an area of memory in which one bit represents an individual pixel on the screen. Thus with one bitplane each pixel can have either a one or a zero, giving a total of two different colours. Each additional bitplane raises the possible combinations by a factor of two, so two bitplanes gives four possible colours, three bitplanes gives eight colours and so on. The AGA machines can have a total of eight bitplanes, giving a possible 256 colours.

By using the Copper (part of the custom chipset), the range of colours can be increased using a technique known as HAM or Hold And Modify. This uses a base set of 64 colours, but the pixel data is stored as an offset from the previous colour. This makes it perfect for images involving lots of natural tones and shades, but less useful for sharp changes in



***Art Department Professional* is invaluable to anyone who deals with images on a regular basis**

colour. This can produce an effect known as HAM fringing, where it takes more than one step to change to the desired colour. This effect is not really a problem with the 8-bitplane HAM mode in AGA machines, which has more base colours and can produce 262,144 different colours from a total of 16.8 million.

Animation

Aside from just creating still images, the Amiga is often used to create animations. Animations are not stored as a series of still images, because the processing time required to shift large chunks of memory around would mean they couldn't be played back at realistic speeds. Instead a key frame is stored and the subsequent frames are encoded by saving only the differences between them and the previous frame. This technique, known as delta encoding or differencing, allows the animation files to be much smaller than the total size of all the individual frames, and also means that they can be replayed at a speed approaching 25 frames per second, depending on the resolution.

HINTS AND TIPS

● It is useful to sort the palette in a paint package so that the colours are not just jumbled up, but that they follow in some form of sequence. This makes it much easier to use features such as colour cycling.

● Don't use a screen mode which has more colours than you are actually using. This doesn't affect the size of the file dramatically, but it does mean you are using a lot more valuable Chip memory than is necessary.

● Try not to use HAM for animations. Although the extra colour range is nice, it is not always necessary when animating, because the speed of the animation blurs the image slightly anyway.

● HAM mode uses extra processing power as well as extra memory, so HAM animations will run a lot slower than those using standard bitplane graphics.

● When morphing, it is best to morph between images of roughly the same shape, and also to make sure that the object to be morphed is centralised in each initial image file.

● A maths co-processor will speed up operations such as ray-tracing and morphing, because most of the time is taken up with geometric equations. Ordinary painting programs will not be that much faster.

● When modelling objects before ray-tracing, remember that the object needn't be exactly realistic. Much detail can be left out without any great detriment to the final image (and it's a lot quicker).

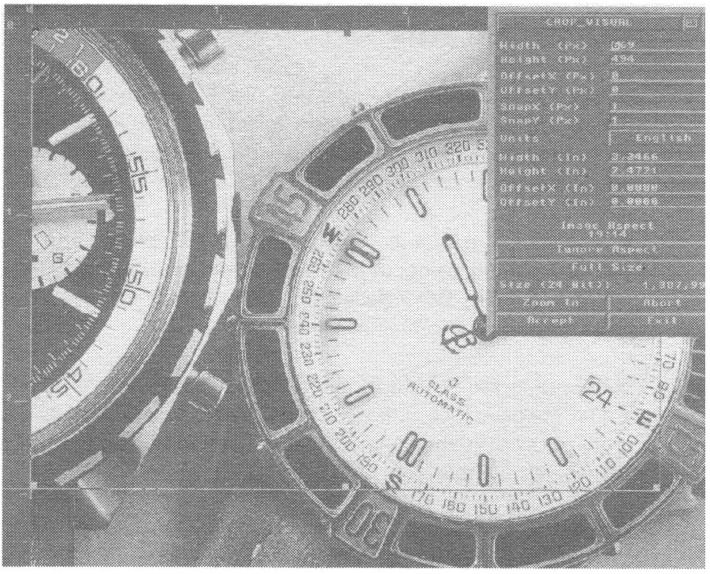


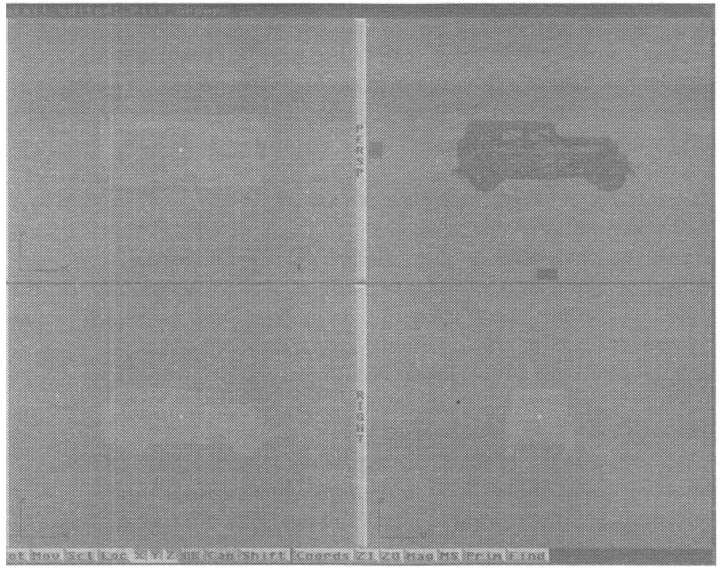
Image processing is very useful for video and presentation work. *Art Department* can also work on animations, but only one frame at a time.

One interesting area of animation is a process known as morphing. This has been used in many adverts and videos, and involves one image slowly transforming into another. Morphing is not difficult to do on the Amiga – there is even a PD program called *VMorph* which does quite a good job.

Ray-tracing

The Amiga doesn't need you to draw its images either – it can create its own with a ray-tracing package. Ray-tracing developed from CAD systems used to design parts for engineering purposes. After the technical drawing was finished, it was often useful to 'visualise' the part. The computer could take the dimensional data and draw an image using simple rules of perspective and hidden line removal.

The process has come a long way since then, and now it is quite possible to create photorealistic images which exist only in the universe of your Amiga's RAM. Shows like the American *Babylon5* and Steven Spielberg's *SeaQuest* use this technique to create realistic visual effects and reduce the cost of the production.



Imagine, possibly the best ever ray-tracing package, and it was given away with *AF53*!

SOFTWARE:
Art Department Professional (ASDG)

Known to users as *ADPro*, this software is indispensable to anyone who uses a great deal of graphics, particularly 24-bit files. It was originally designed as a utility to transfer images between the different file formats (such as TIFF, PICT, PCX and GIF) used on many professional computers, but soon developed many additional image processing features.

Deluxe Paint (Electronic Arts)

Deluxe Paint has been the de riguer paint package on the Amiga since the beginning. Its ease of use has made it popular throughout the world and it is probably the most widely used software on the Amiga, mainly thanks to being included in just about every Amiga bundle that has ever existed. The latest version – *DPaint IV AGA* – includes support for HAM8 and the new AGA display modes.

ImageFx (GVP)

A relative newcomer to the scene, this top software is a cross between a traditional image processing package and a paint program. It has become quite popular due to its flexible interface and great speed.

Brilliance (Digital Creations)

A 24-bit paint package which, although very expensive, shows the true potential of the Amiga as a graphical tool. *Brilliance* works in a full 24-bit colour resolution, which, although it cannot be displayed directly on a shop standard Amiga, can still be used in publications or displayed via a graphics card for presentation or video work.

Imagine 2.0 (Impulse)

Once this was the greatest 3D rendering software the world had ever seen. That is soon to change when version 3.0 is released, but if you want to check out this software, get a back issue of *Amiga Format* 53, which featured a fully working version of Imagine 2.0 on the Coverdisk.

Morph Plus (ASDG)

A companion to *ADPro*, this software is capable of producing seamless transitions between two completely different images. This software has already been used by Hollywood production companies, but use in the home will be restricted by memory overheads – 6Mb is recommended for serious use.

Real 3D 2 (Activa)

The original *Real 3D* was a big hit because it did away with triangular vertices and used pure mathematical forms for its models. This did make it a rather complex business to construct shapes. This new version solves these problems and also adds features which make it capable of matching the Lightwave software which runs on the $2,000 Toaster system.

VIDEO

VIDEO

The VideoPilot enables the Amiga to take complete control of the editing process, including all the wipes and effects you could ever wish to use.

The graphics power of the Amiga lends itself very well to the world of video. Probably the most simple operation it is called upon to perform is to add video captions.

This requires a piece of software to generate the image of the text, and a piece of hardware to combine the Amiga graphics data with the video image. This hardware is known as a genlock.

The concept of genlocking is quite simple. The genlock acts as a very fast switch. Normally it is set to let the video picture flow through, but at the same time it monitors the computer graphic output. If the output for a particular pixel is not the background colour, then the computer graphic output is switched through.

The concept may be simple, but the practice is not. In order for this process to work properly, both the Amiga graphic and the video image must start their displays at the

same point of time – they have to be synchronised. Fortunately, the Amiga has provision for its display clock speed to be fiddled with. The genlock simply slows down or speeds up the Amiga display clock until the images are in sync. The Amiga's ability to do this means that genlocks, on the whole, are much cheaper than on other machines such as the PC.

Once you have a genlock, you can quite easily use a paint package like *DPaint* to generate your captions – the genlock is keyed to the background colour, so you can in fact genlock with any image, even a Workbench screen. Your graphics don't have to be limited to text either, you can just as easily genlock with pictures or icons (as in *The Chart Show*) or even with animations.

Taking the concept of genlocking several stages further, NewTek's Video Toaster is a complete video studio combined on to a single expansion card for the Amiga Zorro slot (A4000). The Toaster includes rendering software and real time digital video effects.

Chromakey

The reverse of video genlocking is known as Chromakeying. This is when the video signal is analysed for a particular colour. When this is found, the output is switched to the computer graphic. This effect is also sometimes known as Colour Separation Overlay or CSO.

The advantages of this are that actors or objects can be portrayed against a coloured backdrop. The backdrop can then be keyed out and replaced with a computer image, giving the impression that they are superimposed on top of the computer image. This is a technique you can see every day if you tune in to Michael Fish after The News.

In practise, it is usually more convenient to use a technique known as Lumakeying (which is supported by just about every Chromakey device, including RocTec's RocKey). The idea behind this is that instead of a particular colour, a particular luminance level is used as the 'transparent' part of the video image. This is very useful when keying where the backdrop colour cannot easily be controlled, often during outdoor work (it is often difficult to get the gods to change the colour of the sky to just the right shade of blue). By fiddling around

with the settings, a chromakey unit can be used to generate all sorts of bizarre analogue processing effects, such as those which appeared on *Top of the Pops* in the days of Pan's People and Jimmy Saville.

Digitising

Digitising is the process of converting a video image into a computer graphic. This is done in hardware, using an Analogue to Digital Converter (ADC). There are quite a few digitisers available for the Amiga. The best are the type known as frame grabbers. These grab a single frame of video into memory in one go, giving a really clear and stable final image. A normal digitiser may need the video image to remain still for several seconds, so they cannot realistically be used with video recorders.

The resultant images can be used in the same way as normal Amiga generated graphics. Digitised images are often used as guides for animation drawings. This is a technique known as Rotascoping, and is probably best illustrated by some of the sequences in the film of Tolkein's *Lord Of The Rings*.

SOFTWARE/HARDWARE

Video Director (Gold Disk)

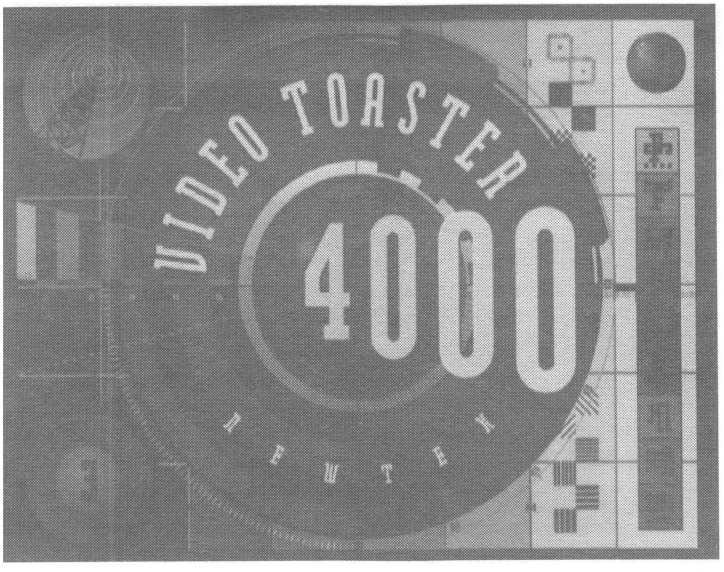
This software and hardware combination will help you rationalise your video collection. The software enables you to build up a selection of 'takes' or clips from your video, and then controls two video decks (or one VCR and a camera) via a LANC cable or using a remote control device to edit them together on to a new tape.

RocKey (RocTec)

The RocKey is a chromakeying device which provides a cheap and very effective CSO solution for the amateur videographer. As well as standard chromakeying, the RocKey can also be used as a lumakeying device. You will need a genlock to use the chromakey, but any one will do, you don't have to get the RocTec one.

G-Lock (GVP)

This is probably the best medium-cost genlock available for



The Video Toaster is a top of the range video solution for the Amiga, used to generate video effects for broadcast TV such as the recent *SeaQuest* DSV series.

HINTS AND TIPS:

- When genlocking, try to use Interlace screen modes. This creates a more stable video signal output, even if it may look terrible on your Amiga display.

- Fading up captions very quickly and then fading them down is far more preferable to just plonking them on the screen – it looks more natural.

- When chromakeying, the best background to use is a neutral blue, because it won't interfere with flesh tones of any people in the video image.

- When digitising, try to use either a framegrabber, or digitiser from a camera. The still pause mode on even the most expensive VCR decks is simply not stable enough.

Even a simple paint package can be used in conjunction with a genlock for titling work.

the Amiga. The quality is very good, although not of broadcast quality. The most important aspect is that the genlock functions, such as fading, brightness and so on, are all controlled by software. This means that you can program your own scripts to perform effects automatically.

Vidi-12 (Rombo)

The Vidi digitiser gives surprisingly good results and is reasonably cheap. It is the product of many years of development, so both the software and hardware have been refined to perfection.

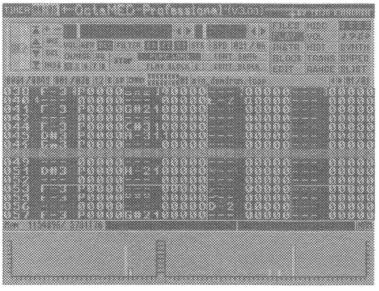
MUSIC

THE MUSICAL AMIGA

Every member of the Amiga range is quite a renowned musician, although sadly not as popular in the professional recording studio as arch rivals from Atari and Apple.

Computer sound has come a long way from the bleeps and pings of the first video games. The Amiga has a 4-channel 8-bit PCM sound generator, which means it can replay up to four real sounds simultaneously with decent sound quality.

To make the most of the sounds, make sure you connect the Amiga's audio output to a decent hi-fi amp and speakers. You can connect the phono outputs from the back of the Amiga directly into any amplifier which has an Aux (Auxiliary), Line-in or CD input, though it may not necessarily have the same connectors as the Amiga. Tandy will be able to supply any audio cable required for this connection.



It may not mean much to a musician, but for the untalented amongst us, MED is a godsend.

Turn the volume up when playing a decent alien blaster, spill some beer on the floor, get someone to blow cigarette smoke in your face and you'll soon be convinced you're in an arcade.

Soundtrackers

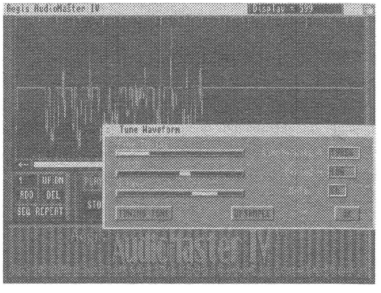
The easiest way to make the most of Amiga sound yourself is to get hold of a program called *MED*. *MED* is the best 'soundtracker' program available, but what, you may ask, is a soundtracker when it's at home?

The Amiga can load digitised sounds into its memory, and when sent to the audio channels at different rates the sounds can be replayed at different pitches. So with a single sound sample of a piano, it is possible to create an entire melody. You can even replay the same sound in different pitches at the same time to create chords.

A soundtracker is a program specially created to make

writing tunes in this way as easy as possible. Four empty tracks scroll up the screen, representing the four sound channels. Each time you press a key, a sound event is recorded in one of the tracks. When the tracks loop around again, the sound will be played. By adding different events in this way, you can build up complex sounds. For example, the first time around you might add a bass drum sample. The next, you add some hi-hats, and then some bass guitar. Eventually you will end up with an entire song with which you can threaten members of your family.

There are hundreds of modules – songs created with *MED* and other sound trackers – in the Public Domain, so ask your favourite library for some good ones: you'll be amazed at the quality of the better ones, as they sound as good as a typical chart single (if not better). Most of the 'demo' programs available play tunes created with sound trackers in the background as they flash graphics and text on the screen.



Some sampling software also enables the user to perform real time audio effects - useful for those Kareoke nights.

For those who want a lazy approach to making music, programs such as *SuperJAM!* can largely automate the process. You only need to specify the style of music you require, the chords you like, and press a button.

Samplers

But how do you get the sound samples in the first place? Again, the Public Domain is littered with disks containing nothing but samples. There are so many it would take years to listen to them all.

If you really need a particular sound sampled (your own voice, for example) you will need to buy a sampler – a small cartridge that connects to the printer port and any convenient sound source. With a sampler and *MED* you can make your own songs, complete with your own voice and musical instruments. Most sound samplers are 8-bit, which is a measure of resolution and therefore quality. An audio CD uses 16-bit

sound samples, which is why they sound as good as they do. Several manufacturers make Amiga samplers which will work with 16-bits, although they tend to be on the pricey side and are more for the dedicated musicians than the dabbler.

MIDI

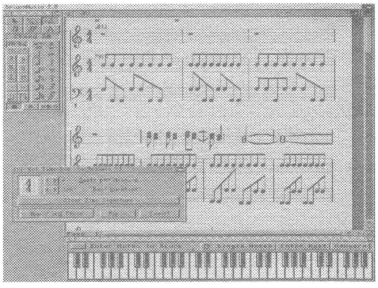
There are times when the sound quality from the Amiga isn't quite good enough, or times when you need more than four sounds at once. When this happens you will need to resort to external sound generators, such as synthesisers, sound modules or drum machines.

Check around in the music magazines (may we recommend *Future Music* perchance?) for modules – they start at about £150 to £200 and even a cheap one will convince you that you got a bargain. A module is essentially a synthesiser without the keyboard, but if it is being controlled by your Amiga, you don't really need one. All proper electronic musical instruments now support the MIDI standard (musical instrument digital interface) which provides a standard way of hooking them all together. This is an extension of serial transfer. The data is transmitted to the sound generator by the Amiga in the form of numerical data, which tells the instrument, what note to play, how long to play it and several other things besides.

Even better, the Amiga can be fitted with a small interface which connects to the serial port and provides a full MIDI interface. With suitable software, your Amiga could conduct an entire symphony using external sound modules. Most recording studios relay heavily on computers to manage their sounds, although Commodore's decision not to fit MIDI ports as standard has cost the Amiga a lot of credulity in this field.

The term 'suitable software' is open to debate, but basically you need a music sequencer. As per usual, you have a wide choice but the better ones cost a lot of money. *Bars and Pipes Professional*, for example, has enough power to control the sounds on an entire album to professional standards, but costs over £200.

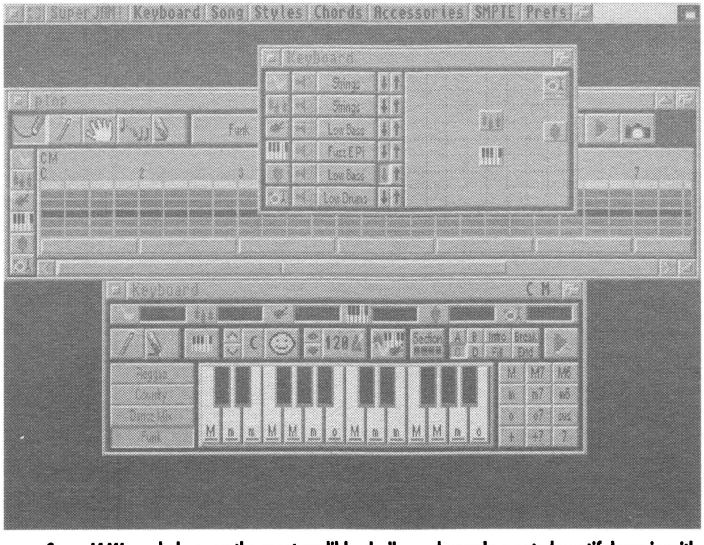
Bargain of the year has to be the copies of *Music-X* which are floating about. *Music-X* version two has been coming 'real soon now' for years, and the price of v1.1 has



Sheet music can be generated from note data or entered by hand with a notation package.

plummeted. Although this program is a pig to learn, once mastered it is exceptionally powerful and can be picked up for a song if you look around. The best place to find it is at a show.

If you are very financially challenged, *MED* can generate MIDI code to control external instruments, though it is a far from ideal way of doing it.



***SuperJAM!* can help even the most audibly challenged people create beautiful music with their Amiga. The best thing is that it is free with issue 54 of *Amiga Format*.**

With a synthesiser you can enter notes with a proper musical keyboard instead of the computer keys or mouse, and with a dedicated drum machine you can free-up your Amiga samples for more instruments or vocals. You can even connect a MIDI-compatible guitar and use it to enter notes if required.

Notators

With the music safely trapped inside your Amiga, it's sometimes nice to get it out on to paper in order to share it with other musicians. *Deluxe Music Construction Set* is an excellent program for this sort of endeavour, and it also greatly simplifies entering sheet music for conversion into MIDI data.

Finale

With such a powerful sound chip inside the Amiga it's a shame not to use it. The ability to create your own musical accompaniments is one of the features which make the Amiga so much better than a console, or even a PC. Enjoy!

COMMS

COMMUNICATIONS

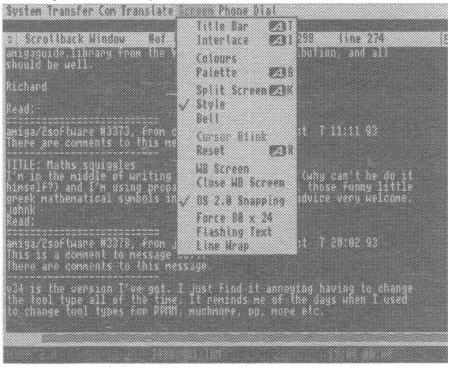
For many Amiga owners the serial connector on the back of their computer is probably the most under-used 25-way plug there is. It just sits there doing nothing other than for the occasional two-player game. This is a great pity, because popular opinion apart, the RS232 port is arguably the most exciting expansion port these is on the Amiga.

Covering the entire planet is a vast web of electronic communications, sending data at the speed of light from computer terminal to computer terminal. If you have a telephone in your house, your Amiga can become part of the global network – and you won't even need an anorak.

Hardware

Before you can tap into the international information system, you'll need some hardware – a MODEM to be precise. Short for MODulator/DEModulator, a MODEM is required to convert serial data from the Amiga into signals suitable for transmission along the tradition voice lines.

As you might expect, modems generally look like dubious black boxes with red flashing lights, and they are available in different speeds, measured as their Baud rate, and obviously the faster the better. A good speed to aim for is 9600 baud, although you might be able to get by with a slower 2400 baud modem if money is tight.

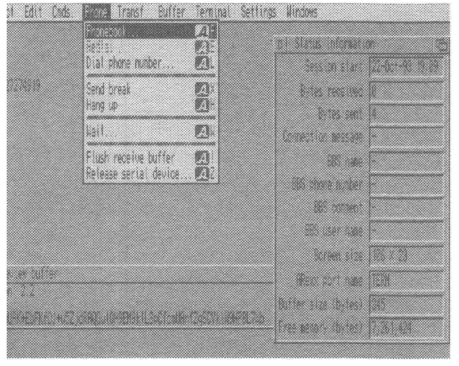


As well as sending messages to local BBS, you can send text files all over the world by tapping in to a Fidonet node. Most established boards are connected to a node.

Many advertisers in *Amiga Format* will be only to pleased to exchange your money for a suitable modem, compete with cable and power supply. Depending on

specification they cost from under £100 to over £1,000, so it might well be worthwhile checking the secondhand market before you part with the readies.

So your computer has a modem connected to the serial port – what now? The other lead from the modem must be plugged into the standard BT (or Mercury, or Hull, or whatever) telephone socket and now all you need is some terminal emulator software.



Comms software has come a long way since the early days of terminal emulators. This is *Term*, an update to a very popular comms package called *NComm*.

Software

In order to transmit and receive data you need a terminal program to redirect your key presses to the modem, and display incoming data on the screen. All the best terminal software available for the Amiga is either Public Domain or Shareware which it means it won't cost you a penny to get hold of it. Good programs to ask your PD library for are *NComm*, *JRComm* and *Term*. Any Amiga is suitable for comms use, as processor speed and fancy graphics don't really come into the process, although some programs now require at least Workbench 2.0 to work properly.

On-line

Now you're ready to get on-line, which is comms jargon for linking up with another computer. If you are wondering what numbers you should dial, don't fret – all over the country are hundreds of Bulletin Board Systems (BBSs) patiently waiting for your call.

A BBS is another piece of software running on a computer in a normal house, in a normal street, in a normal town. When you first call, you'll be assigned a user name and a password which you'll need to remember when you call again. Once on to the system, you can peruse the news sec-

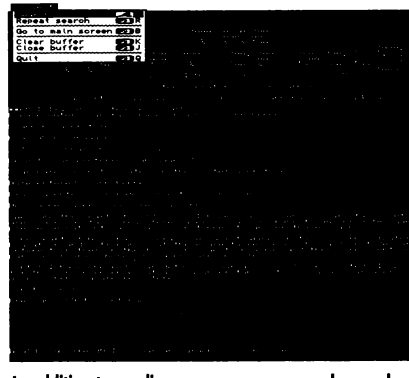
tions, read the mail left by other users and leave your own comments and questions.

You can also get more BBS numbers, and hopefully find one which is only a local call away. Many boards also have special interest sections, so if you are really into astronomy or bird watching you'll soon find a board to interest you. Most callers are normal people, not tech heads, who are happy to discuss all manner of topics about life, the universe and everything and you'll soon make some on-line friends.

Some boards also have games for you to play, information databases to peruse and all sorts of menus to explore. The best part is that all of this is completely free, as the owner of the BBS is organising it totally for fun. He will even pass your mail across the world by means of the Fidonet for free as well – which means you could carry on an electronic mail conversation with an Amiga user in America for the price of a local telephone call.

Free software

Do you like Public Domain software? Do you enjoy watching all the latest demos, disk utilities and Workbench hacks? Then you'll love your local BBS, because they have mountains of the latest PD all waiting for you to download.



In addition to sending messages, you can also send and receive binary files such as pictures, samples and even grams. Most PD becomes initially available on a BBS.

All terminal programs have special protocols called X,Y and Z modem which are used to download binary data such as programs or graphics. Once downloaded, the program will appear on your disks like any other – except you don't have to wait a week for it to be posted to you.

While you are downloading large programs is when the benefits of a fast modem become apparent, as a file which would take five minutes on a good 14,400K modem will take at least half an hour on a 2400 baud system. Repeat this on

a nightly basis and it will make a big difference to your next telephone bill.

If you get hold of a new program, it's a good idea to upload it to your local BBS. That way you will be giving something back, and this will help your download/upload ratio and probably get you better access to the more advanced sections of the board. Remember that only freely available software may be transmitted in this way – it is an offence to spread cracked games, and you could get into trouble if you try.

Commercial systems

Besides the amateur BBS network, there are several commercial systems in existence. These systems are usually a lot larger, and are frequented by many names you may find familiar – *Amiga Format* for example. These systems are run on a subscription only basis, and usually require payments to be made by credit card.

Fax

Here's another reason to get a modem – most can double up as Fax machines. With a suitable program, such as *GpFax*, you can send normal Amiga graphics directly to another Fax machine, or receive Faxes and save them to disk or send them to your printer. Ideal for the small office in need of a plain paper Fax machine.

You can even get Amiga add-ons which combine all these features with an intelligent electronic answering machine. The GVP PhonePak is a state-of-the-art system which can actually record messages on your hard disk when you are not about. You can also add voice mail facilities, which means callers can interact with your computer and even request Faxes to be sent.

Useful numbers
Commercial systems

CIX	081-390 8446 (Voice)
Compuserve	0800 289458 (Voice)

Amateur Bulletin Board Systems (Modem numbers)

Amiga Connection	081-503 0593
Hawk's Realm	081-863 8751
Quasar	0846 693067
Wacky Carrot Amiga	0732 871878
Waltons Mountain	081-891 5730
YukonHo	0232 768163
Big Bang Burger Bar	081-420 6356
Lightfinders Place	0202 485723
MicroMola	081-316 7402
The Penthouse	071-930 3903
Sheffield	0742 325232
Stealth BBS	0532 557739
Heart of Gold	0247 274919

GLOSSARY

GLOSSARY

It can be very difficult to understand what is going on with your computer if you don't even understand the language and terms used. Here is a brief, but useful, glossary to the currently in-vogue technojargon.

8SVX – A file format conforming to the IFF standard for sound data.

AGA – The Advanced Graphics Architecture is the term used to describe the new Amiga custom chip set as found in the A1200 and the A4000. The new chips, Alice and Lisa, give the Amiga its new screen modes and huge 16.8 million colour palette.

ARexx – ARexx, or Amiga Rexx, is a programming language particularly developed for control applications. Many software packages support an ARexx port, which allows them to be controlled directly by an ARexx script. This means that one program can very easily control another, and also facilitates the writing of time saving macro scripts.

ASCII – A universal standard file format for storing plain text. The ASCII character set does not allow for text styles such as bold or underlining, so although many word processors support this for importing data, very few use it as the file format of choice.

BASIC – Beginners All-purpose Symbolic Instruction Set is a programming language which was specially developed to make it easier for non-scientists to program a computer. There are several different versions of Basic available for the Amiga, the best of which is undoubtedly Blitz Basic 2, given away with *AF*51.

Blitter – BLock Image TransfER device. Used for transferring large areas of memory from A to B. Often used for creating graphics objects called BOBs (Blitter OBjects) in games.

Buffer – These are memory caches controlled by the Amiga that speed up data transfer between the computer and the disk drives or other external devices.

CLI – The Command Line Interface. The screen where you input commands into the computer for immediate execution.

Chip RAM – Also known as graphics memory, this is the memory that can be directly accessed by the Amiga's custom chips. Basically, the more you have the better, but the limits are much lower than on Fast RAM. The maximum Chip RAM possible is 2Mb on the A1200 and A4000.

Copper – CO-PROcessor built into the Agnus chip. Can be used to change colours on screen as the screen is being generated, to give graduated backgrounds.

CPU – The central Processing Unit is the brain of your computer. This is the silicon wizardry which performs all the instructions fed to it by your software applications. The type of CPU fitted to your machine will greatly affect how fast it operates. The A1200 is fitted with a 68EC020 processor which is about four times as fast as the old 68000 as found in the original A500.

FFS – Fast File System is a type of disk format, used mainly on hard drives to make access times slightly faster. This format can be used on floppy disks too, but it is paradoxically slower (although it does give an extra 41k of space).

FPU – A Floating Point Unit (also referred to as a maths-coprocessor), speeds up your computer by handling all of the mathematical operations itself, giving the CPU more time for other operations. The 68881 and 68882 are suitable FPUs to use with the Amiga range.

GUI – Graphical User Interface. Point and Click or WIMP (Windows, Icons, Mouse, Pointer) found on most computers these days. The Amiga's GUI is Workbench. Now in its third incarnation, Workbench is a powerful and flexible way of performing file handling tasks on your Amiga.

HAM – Hold And Modify – a software kludge which enabled the pre-AGA machines to display up to 4096 colours on screen (in lo res only). This has been superseded by HAM8 mode, which allows 262,144 colours on an AGA machine.

IDE – Intelligent Drive Electronics. IDE is a kind of hard drive used by the Amiga 600, 1200 (2.5-inch models) and 4000 (3.5-inch models), since much of the controller circuitry is on the drive itself, IDE interfaces are quite cheap to include in a computer. And since IDE drives are used in PCs they are plentiful and cheap.

IFF – Interchange File Format. This is a standard developed to make sure that similar applications can share data files. Any art package will be able to import an IFF picture file for example.

JPEG – The Joint Photographic Experts Group gave its name to a standard image compression technique which enables photorealistic 24-bit images to be compressed to a fifth of their original size with no loss of quality.

Kickstart – The programs, stored in ROM, that are executed when the Amiga is switched on to 'kick it into life'. The current version is 3.

Link Virus – This is a computer virus which does not spread via the boot block, but instead attaches itself to the ends of files (usually one found in the startup-sequence).

MPEG – The Motion Picture Expert's Group, in a piece of blatant plagiarism, chose their initials to name a compression format for storing full motion video. This is the technique behind the FMV cartridge on the CD32.

MMU – A Memory Management Unit. This is part of a full version of the 68030 and 68040 processor chips. The Amiga doesn't actually need one to run, so Commodore use the EC versions of these chips (with no MMU) but the odd piece of software (like the Gigamem virtual memory system) requires it to work.

Noisetracker – A generic term used to describe music notation software developed for programmers, not musicians. The best examples of this genre are ProTracker and MED.

Printer driver – This is a software patch which allows the Amiga to use any of the great number of printers available. The driver translates the printing instructions from the software into codes which are meaningful to the printer itself.

RAM – Random Access Memory, the silicon chips that the computer uses to store programs and files it is currently using. When the machine is turned off, files stored in RAM are lost.

ROM – Chips that have files 'blown' into them, these files are then stored permanently, whether the machine is turned on or off.

SAGE – Standard Amiga Graphics Expansion. This was a standard developed for 24-bit graphics cards, to enable them all to be accessed easily through software. Unfortunately, it never really caught on.

Sampler – A device which digitises sound so that it can be used in computer music programs. Samplers usually take inputs from devices such as tape recorders and CD players, but they can also accept microphones to sample from the 'real world'.

SCSI – Small Computer Systems Interface. This is a hardware interface standard which is common on many different types of computer. Having a SCSI interface means that you can connect high speed hard drives, and other storage devices to your Amiga.

Shell – The new version of the Amiga's CLI. It works in exactly the same manner as the CLI, but allows commands to be given 'aliases' making them easier to type in.

Sprite – A graphic that can move over a background without affecting it. Used for mouse pointers, or in games for missiles, ships, and so on.

Startup-sequence – A script file which is executed by the Kickstart on booting up your Amiga. This contains any commands, such as assigning paths or displaying pictures, you wish to be executed at startup.

Task – A task or process is one individual software application which is running. Because the Amiga multitasks, it is possible to have more than one piece of software running at any one time. Each of these current applications is known as a task.

Virus – An unwanted computer program which replicates itself on a host system and damages data or causes annoyance.

Zorro – The bus expansion slot found in all the 'big box' Amigas. The standard expansion is now Zorro III (since the A3000) which features a multiplexed data bus enabling much faster hardware interfaces.

CONTACTS

...rvice
...endish Road
Stevenage
Herts
SG1 2DY
0438 313361

Indi Direct
Hardware and software
Unit 1, Ringway Industrial Estate
Eastern Avenue
Lichfield
Staffs
WS13 7SF
0543 251275

INOVA...
Di...

...urope
quality printers
...ngwalk Road,
...ey Park,
...e
...x
...
...age, ProDraw,
...a

CONTACTS

One of the biggest difficulties is sometimes just being able to talk to the right people. Here is a list of useful names, addresses and phone numbers for hardware and software developers across the globe.

17 Bit Software
Public Domain and Shareware
22-8 Market Street
Wakefield
West Yorkshire
WF1 1DH
0924 366 982

24 Bit Club
User group for 24-bit and DTP
6 Skirsa Square
Floor 1
Glasgow
Scotland
G23 5DW

Acid Software
The company behind *Skidmarks* and *Blitz Basic*
37 Camden Square
Camden Town
London
NW1

Activa International
Developers of Real3D
Keienbergweg 95
1101 GE Amsterdam
The Netherlands
010 31 20 691 19 14

Almathera
CD developers for the masses.
Challenge House
618 Mitcham Road
Croydon
CR9 3AU
081-687 0040

Amiga Centre Scotland
Professional video specialists
Harlequin House
Walkerburn
Peeblesshire
Scotland
EH43 6A
089 687 583

ASDG
The people behind *ADPro*
925 Stewart Street
Madison, Wisconsin 53713
USA
0101 608 273 65853

Blue Ribbon Soundworks
Music specialists and inventors of *SuperJAM!*
Venture Centre
1605 Chantilly
Suite 200
Atlanta
GA 30324
0101 404 315 0212

Canon UK
Manufacturers of printers
Canon House

Manor Road
Wellington
Surrey
SM6 0AJ
081-459 1266

Central Coast Software
Quarterback, Quarterback Tools
1206 Wild Basin Road
Suite 109
Austin
Texas 78746, USA

Commodore Business Machines UK Ltd
Fathers of the Amiga
Commodore House
The Switchback
Gardener Road
Maidenhead Berks SL6 7XA
0628 770088

Computer Manuals
Suppliers of books to the gentry
50 James Road
Tyseley
Birmingham B11 2BAL
021-706 60000

Cumana Ltd
External disk drives
Pines Trading Estate
Broad Street,
Guildford
Surrey
GU3 3BH
0483 503121

Cynostic PD
Public Domain software
85 Wyken Croft
Coventry
CV2 3AD
0203 613 817

Europress Software
Creators of AMOS – the creator
Europa House
Adlington Park
Macclesfield
SK10 4NP
0625 859444

Digita International
Wordworth, Digita Accounts
Black Horse House
Exmouth
Devon EX8 1JLW
0395 270273

Digital Creations
Brilliance, DCTV
PO Box 97
Folsom
California 95763
USA
010 916 344 4825

Electronic Arts
Deluxe Paint and Deluxe Music
90 Heron Drive
Langley
Berks
SL3 8XP
0753 549442

EI/Empire
AMax and various games
4 The Stannets
Laindon North Trade Centre
Laindon
Essex
SS15 6DJ
0268 541 1260

First Computer Centre
Hardware and software distributor
71 Beechwood View
Leeds
LS4 2LP
0532 319 444

Fujitsu Europe
Top quality printers
2 Longwalk Road,
Stockley Park,
Uxbridge
Middlesex
UB11 1AB

Gold Disk
Professional Page, ProDraw, Hyperbook
Spectrum Way
Unit 5, Mississauga
Ontario
Canada
L4W 5A1
0101 416 602 4000

Golden Image
Various hand scanners
Unit 12a
Milmead Business Centre
Milmead Rd
N17 9QU
081-365 1102

GVP - Great Valley Products Incorporated
hHard drives, ImageFX and various hardware
600 Clark Avenue
King of Prussia
PA 19406, USA
0101 215 337 8770

ICL
Warranty support from 1st September
Customer Service
Cavendish Road
Stevenage
Herts
SG1 2DY
0438 313361

Indi Direct
Hardware and software
Unit 1, Ringway Industrial Estate
Eastern Avenue
Lichfield
Staffs
WS13 7SF
0543 251275

INOVAtronics Ltd
Directory Opus, CanDo
Unit 11
The Enterprise Centre
Cranborne Road
Potters Bar, Herts EN6 3DQ
0707 662861

Kompart UK/Playbyte
Craft, InterOffice
25 Hart Road
St Albans,
Herts
AL1 1NF
0727 868005

MegageM
FractalPro, NueroPro
1903 Adria
Santa maria
California 93454
USA
0101 805 349 1104

Meridian Software Distribution
Various software
East House
East Road Industrial Estate
London
SW19 1AR
081-543 3500

MicroPACE UK
Software and hardware distributors
Unit 10 Perth Trading Estate
Slough
Berkshire
SL1 4XX.
0753 551888

Moonlighter Software Development
Ami-Back, Ami-Back Tools
3208-E.E. Colonial Drive
Suite 204
Orlando
Florida 32803, USA
0101 407 384 9484

Ocean Software Ltd
Nearly every film licence ever
6 Central Street
Manchester
M2 5NS
061-832 6633

Oxxi-Aegis USA.
Presentation Manager, Video Titler, SBase4
339 E 28th St
Long Beach
California 90806, USA
0101 310 427 1227

Phoenix Computerworld
Various soft and hardware
Unit 2 York Towers
York Road
Leeds LS9 6TA
0532 350652

Power Computing
HD external drive, scanners and memory boards
Unit 8
Railton Road
Woburn Industrial Estate
Kempston
Bedford MK42 7PN
0234 843 388

Rombo
Vidi digitisers, Take 2
2 Baird Road
Kirkton Campus,
Livingston
Scotland
EH54 7A
0506 414631

Silica Distribution Ltd
Official GVP dealer
Unit 10
Ruxley Corner Ind Estate
Sidcup-By-Pass
Sidcup, Kent DA14 5SS
081-309 1111

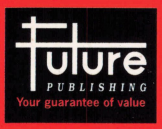
Software Demon
Hardware and software developers
Flat 1, 37 Bread Street
Penzance, Cornwall
TR18 2EQ
0736 331499

Supra Corporation
RAM expansions, modems and hard drives
7101Supra Drive SW,
Albany
Oregon
OR 97321
0101 503 967 9075

Team17
Software supremos
Marwood House
Garden Street
Wakefield
West Yorkshire
WF1 1DX
0924 291 867

Trilogic
Various hardware and software
Unit 1
253 New Works Road
Bradford
BD12 0QP
0274 691115

Virtual Reality Labs
Vista, Distant Suns
2341 Ganador Court
San Luis Obispo
CA 93401
USA
0101 805 545 8515

Free with the Christmas 1993 issue of Amiga Format

Not for resale